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Route to:

PATENTS

March 4, 1986

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Jan. 1986

Affirmed	141
Affirmed in Part	20
Reversed	65
Total	226

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 1, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,375,107 through 4,375,701
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 15, 1985, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,305,243	06/216,825	12/15/81
4,305,878	06/225,289	12/15/81
4,305,954	06/233,653	12/15/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,854,664, Re. S.N. 800,794, Filed Nov. 22, 1985, Cl. 239/206, SPRINKLER SYSTEMS, Vernon A. Johnson, Owner of Record: *Toro Co., Riverside, Calif.,* Attorney or Agent: Robert V. Jambor, Ex. Gp.: 313

4,217,852, Re. S.N. 806,798, Filed Dec. 9, 1985, Cl. 118/405, APPARATUS FOR THE MANUFACTURE OF A COMPOSITE METAL WIRE, Masahiro Nagai, et al., Owner of Record: *Hitachi Cable, Ltd., Tokyo, Japan,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 152

4,242,368, Re. S.N. 806,799, Filed Dec. 9, 1985, Cl. 427/11, METHOD FOR THE MANUFACTURE OF A COMPOSITE METAL WIRE, Masahiro Nagai, et al., Owner of Record: *Hitachi Cable, Ltd., Tokyo, Japan,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 152

4,411,270, Re. S.N. 791,227, Filed Oct. 25, 1985, Cl. 128/653, APPARATUS AND METHOD FOR NUCLEAR MAGNETIC RESONANCE SCANNING AND MAPPING, Raymond V. Damadian, Owner of Record: *Inventor,* Attorney or Agent: Richard C. Conover, Ex. Gp.: 335

4,420,942, Re. S.N. 810,196, Filed Dec. 18, 1985, Cl. 62/53, NITROGEN LIQUID TO GAS CONVERTER EMPLOYING WATER HEAT EXCHANGERS, Warren E. Davis, et al., Owner of Record: *Inventors,* Attorney or Agent: B. R. Pravel, et al., Ex. Gp.: 344

4,421,119, Re. S.N. 811,864, Filed Dec. 20, 1985, Cl. 128/660, APPARATUS FOR ESTABLISHING IN VIVO BONE STRENGTH, George W. Pratt, Jr., Owner of Record: *Massachusetts Institute of Technology, Cambridge, Mass.,* Attorney or Agent: Henry D. Pahl, Jr., et al., Ex. Gp.: 335

4,421,120, Re. S.N. 810,574, g06 Dec. 18, 1985, Cl. 128/725, PEAK RESPIRATORY FLOW MONITOR, Rodney Edwards, Jr., et al., Owner of Record: *Biotrine Corp., Woburn, Mass.,* Attorney or Agent: Bruce D. Sunstein, Ex. Gp.: 335

4,424,250, Re. S.N. 800,180, Filed Nov. 20, 1985, Cl. 428/198, CARPET FACED TEXTILE PANEL, Ronald W. Adams, et al., Owner of Record: *Gates Formed-Fibre Products, Inc., Auburn, Me.,* Attorney or Agent: Frank P. Grassler, et al., Ex. Gp.: 154

4,424,426, Re. S.N. 815,819, Filed Jan. 2, 1986, Cl. 200/61.6, BATTERY POWERED DRAWER OPENING DEVICE, Shiro Ishii, Owner of Record: *M. S. Corp., Stanton, Calif.,* Attorney or Agent: V. M. Creedon, Ex. Gp.: 214

4,428,759, Re. S.N. 816,000, Filed Jan. 3, 1986, Cl. 133/62, DISTILLATIVE SEPARATION EMPLOYING BOTTOM ADDITIVES, James M. Ryan, et al., Owner of Record: *Koch Process Systems, Inc., Westboro, Mass.,* Attorney or Agent: Richard P. Crowley, Ex. Gp.: 133

4,435,855, Re. S.N. 797,656, Filed Nov. 13, 1985, Cl. 623/6, UNIVERSAL INTRAOCULAR LENS AND A METHOD OF MEASURING AN EYE CHAMBER SIZE, Jaswant S. Pannu, Owner of Record: *Inventor,* Attorney or Agent: Donald W. Banner, Ex. Gp.: 332

4,452,020, Re. S.N. 792,913, Filed Oct. 30, 1985, Cl. 52/202, INSULATING STORM WINDOW ATTACHMENT, David G. Werner, Owner of Record: *Mr. Seal Tite, Inc., Oshkosh, Wis.,* Attorney or Agent: Thomas D. Wilhelm, Ex. Gp.: 354

4,462,346, Re. S.N. 816,404, Filed Jan. 2, 1986, Cl. 123/73A, DUAL FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE, David F. Haman, et al., Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Robert E. Clemency, Ex. Gp.: 342

4,464,652, Re. S.N. 811,635, Filed Dec. 20, 1985, Cl. 340/710, CURSOR CONTROL DEVICE FOR USE WITH DISPLAY SYSTEMS, Dean Hovey, et al., Owner of Record: *Apple Computer, Inc., Cupertino, Calif.,* Attorney or Agent: Roger W. Blakely, et al., Ex. Gp.: 264

4,476,641, Re. S.N. 815,228, Filed Dec. 31, 1985, Cl. 337/118, STARATA ROCK BUCKET, Paul V. Ballinger, Owner of Record: *Inventor,* Attorney or Agent: David D. Murray, Ex. Gp.: 337

4,481,616, Re. S.N. 811,152, Filed Dec. 19, 1985, Cl. 369/58, SCANNING CAPACITANCE MICROSCOPE, James R. Matey, Owner of Record: *RCA Corp., Princeton, N.J.,* Attorney or Agent: Birgit E. Morris, et al., Ex. Gp.: 235

4,489,829, Re. S.N. 816,499, Filed Dec. 27, 1985, Cl. 206/287, HANGING BAG WITH DETACHABLE COWL, Jay E. Myers, et al., Owner of Record: *Andiamo, Inc., Fountain Valley, Calif.,* Attorney or Agent: Richard F. Can, et al., Ex. Gp.: 241

4,492,313, Re. S.N. 808,635, Filed Dec. 13, 1985, Cl. 215/1.C, COLLAPSIBLE BOTTLE, William Touzani, Owner of Record: *Inventor,* Attorney or Agent: James M. Deimen, Ex. Gp.: 241

4,500,177, Re. S.N. 810,346, Filed Dec. 19, 1985, Cl. 350/357, ELECTROCHROMIC IMAGING APPARATUS, Bruce E. Conner, Owner of Record: *Inventor,* Attorney or Agent: William M. Hanlon, Jr., Ex. Gp.: 257

4,505,926, Re. S.N. 808,955, Filed Dec. 16, 1985, Cl. 514/398, QUARTERNARY AMINO IMIDAZOLIDINES, COMPOSITIONS AND USE, Peter M. Newsome, et al., Owner of Record: *Beecham Group p.l.c., Middlesex, England,* Attorney or Agent: Paul T. Meiklejohn, Ex. Gp.: 125

4,517,184, Re. S.N. 816,071, Filed Jan. 3, 1986, Cl. 514/6, PEPTIDES PROCESS FOR PREPARING THE SAME AND PSYCHODEPRESSANT COMPOSITIONS CONTAINING THE SAME, Noboru Yanaihara, et al., Owner of Record: *Amano Pharmaceutical Co., Ltd., Aichi, Japan and Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan*, Attorney or Agent: James E. Armstrong, III, et al., Ex. Gp.: 125

4,522,966, Re. S.N. 809,525, Filed Dec. 16, 1985, Cl. 524/114, NON-FOGGING COATING COMPOSITION AND A SHAPED ARTICLE COATED THEREWITH, Masaaki Funaki, et al., Owner of Record: *Nippon Sheet Glass Co., Ltd., Osaka, Japan and Sumitomo Chemical Co., Ltd., Osaka, Japan*, Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 153

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Lastreto, Inc., by merger of assignment and change of name from Nursery Metal Pots, Inc., San Francisco, Calif., Reg. No. 546,725, for the mark "PLANTAINER", Canc. 14,597.

Union Camp Corp., assignee by merger and change of name, of The Union Bag & Paper Co., New York, N.Y., Reg. No. 57,188, for the mark "COMMODORE", Canc. No. 14,780.

Rennert International Corp., New York, N.Y., Reg. No. 847,783, for the mark "SHURLOCK", Canc. No. 14,595.

Futurama, Ltd., assignee, by mesne assignement, of Mifflin Chemical Corp., British Virgin Islands, Reg. No. 280,104, for the mark "MYLIN", Canc. No. 14,836.

Sentry Drug Centers, Inc., Washington, D.C., Reg. No. 970,993, for the mark "SENTRY DRUG CENTERS", Canc. No. 14,919.

Louis Marx & Co., Inc., assignee by merger and mesne assignment of Louis Marx & Co. Inc., Glen Dale, W. Va., Reg. No. 797,471, for the mark "PLAY-LINE", Canc. No. 14,857.

Gene W. Goble & Associates, Inc., assignee by mesne assignment of Genrus Engineering Specialties, Chatsworth, Calif., Reg. No. 803,321, for the mark "LIFESAVER", Canc. No. 14,714.

Dynabulk Corp., Bellevue, Wash., Reg. No. 893,582, for the mark "DYNABULK", Canc. No. 14,797.

James K. Andrews, assignee by mesne assignement of The "Linda" Co., Santa Ana, Calif., Reg. No. 502,861, for the mark "LINDA", Canc. No. 14,847.

A. C. Hynd Corp., Dayton, Ohio, Reg. No. 510,224, for the mark "HAIR SHEEN", Canc. No. 14,718.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Cullpepers Navajo, Inc., San Diego, Calif., Reg. No. 1,168,773, for the mark "CULLPEPPERS AND DESIGN", Canc. No. 14,818.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assign or legal representative, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Harkness Energy Products, Inc., Panama City, Fla., Reg. No. 1,138,126, for the mark "GAS PLUS", Canc. No. 15,622.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Errata

The following registration numbers were inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazettes:

997,747	TM 290	Apr. 14, 1981
1,076,409	TM 227	Sept. 24, 1985
1,080,605	TM 205	Sept. 10, 1985
1,103,578	TM 220	May 28, 1985
1,114,863	TM 215	Oct. 29, 1985

Consequently, the above-identified registrations are still active.

PATRICIA M. DAVIS,
Jan. 15, 1986. *Administrator for*
Trademark Operations.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 4, 1986

Re. 32,041	4,511,626	4,540,789	4,552,166
D. 280,733	4,511,778	4,541,210	4,552,255
4,226,633	4,511,790	4,542,271	4,552,536
4,311,650	4,511,867	4,542,438	4,552,687
4,366,149	4,517,238	4,542,650	4,553,065
4,386,749	4,518,244	4,543,376	4,553,109
4,400,281	4,518,610	4,544,053	4,553,375
4,414,566	4,521,787	4,544,395	4,553,900
4,415,682	4,523,101	4,544,547	4,554,690
4,421,572	4,525,148	4,544,964	4,554,713
4,427,013	4,525,155	4,545,160	4,554,779
4,440,358	4,525,806	4,545,200	4,555,235
4,448,979	4,526,112	4,546,031	4,555,938
4,452,920	4,528,472	4,546,283	4,556,573
4,461,819	4,531,306	4,546,448	4,557,422
4,462,000	4,532,036	4,547,320	4,557,441
4,464,209	4,533,370	4,547,631	4,557,506
4,468,668	4,533,952	4,547,719	4,557,864
4,471,963	4,534,815	4,547,789	4,557,921
4,472,135	4,537,048	4,548,439	4,558,050
4,477,442	4,537,384	4,548,523	4,558,085
4,477,638	4,537,532	4,548,931	4,558,153
4,478,039	4,537,641	4,549,759	4,558,318
4,484,055	4,537,698	4,549,792	4,558,336
4,485,272	4,537,892	4,550,066	4,558,346
4,498,463	4,538,102	4,550,277	4,558,949
4,501,775	4,538,228	4,550,551	4,559,721
4,503,621	4,538,531	4,551,100	4,559,919
4,505,569	4,540,053	4,551,161	4,560,003
4,506,429	4,540,118	4,551,191	4,561,313
4,507,731	4,540,506	4,551,416	4,562,149
4,510,056	4,540,562	4,551,954	4,562,430

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 1, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-15-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-11-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	4-15-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-26-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-07-85

Expiration of patents: The patents within the range of numbers indicated below expire during February 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,425,060 to 3,426,359, inclusive

Plant Patents ..... Numbers 2,861 to 2,869 inclusive

STATUTORY INVENTION REGISTRATIONS

PUBLISHED MARCH 4, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H29

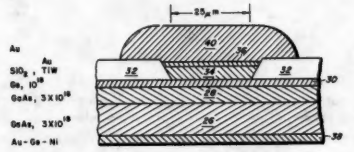
TUNNETT DIODE AND METHOD OF MAKING

Aristos Christou, Springfield, and John E. Davey, Alexandria, both of Va., assignors to The Government of the United States, Washington, D.C.

Filed Jan. 4, 1983, Ser. No. 437,915

Int. Cl.[4] H01L *29/26, 29/88, 29/90, 29/48*

U.S. Cl. 357—13 **8 Claims**



1. A TUNNETT diode comprising:

a substrate of a semiconductor material;

a drift region less than 1 micrometer in thickness adjacent to said substrate comprising a semiconductor of the same type as and of dopant concentration at least ten times less than said substrate;

an epitaxial layered injection region of different semiconductor material compared to said drift region less than 50 nm in thickness adjacent to said drift region comprising a semiconductor of the same conductivity type as and of dopant concentration at least ten times greater than said drift region; and

a metallic electrode adjacent to said injection region forming a Schottky barrier therewith.

H30

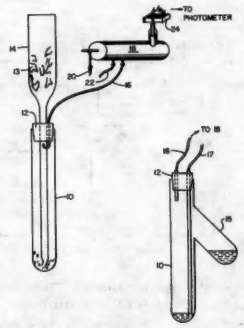
METHOD AND APPARATUS FOR THE PREPARATION OF LIQUID SAMPLES FOR DETERMINATION OF BORON

Darryl D. Siemer, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 8, 1982, Ser. No. 447,846

Int. Cl.[4] G01N *31/12, 31/00*

U.S. Cl. 436—171 **14 Claims**



1. A method for the preparation of a liquid sample for the quantitative determination of boron by flame photometry comprising:

a. combining the sample with an excess of sulfuric acid in a vessel to dehydrate the sample,

b. adding sufficient methanol to said vessel to react with the boron present in the dehydrated sample to form trimethyl borate and to react exothermically with the excess of sulfuric acid to generate sufficient heat in the vessel to volatilize said trimethyl borate,

c. rapidly transferring said volatilized trimethyl borate from said vessel to a flame photometer, whereby boron is determined by flame photometric analysis of the trimethyl borate.

8. An apparatus for analyzing a liquid sample for boron comprising:

a vessel having a small heat capacity and an open top for containing the liquid sample and sulfuric acid,

stopper means in the open top for sealing the vessel,

methanol adding means in the vessel for adding methanol to the sample and sulfuric acid whereby the methanol will react with the boron in the sample to form a trimethyl borate ester and react with the sulfuric acid to produce heat to vaporize the borate ester to a gas,

a sample tube penetrating the stopper for directing the gaseous boron ester from the vessel,

excitation means connected to the sample tube for exciting the boron to emit a characteristic spectrum, and

detection means for detecting the characteristic spectrum and determining the spectral intensity, the intensity being directly proportional to the amount of boron in the sample.

H31

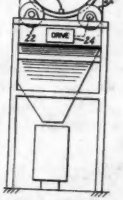
METHOD AND APPARATUS FOR DETERMINING THE SIZE DISTRIBUTION OF TOBACCO

John R. Wagner, 5102 Field-Horney Rd., Greensboro, N.C. 27406; Werner P. Kirschstein, 325 E. Montrose Dr., Greensboro, N.C. 27407, and Floyd S. Cowan, Rte. 1, Box 314A, Sutherland, Va. 24594

Filed Jan. 10, 1983, Ser. No. 456,737

Int. Cl.[4] B07B *1/00*

U.S. Cl. 209—237 **11 Claims**



1. A method of determining the size distribution of tobacco comprising the steps of introducing a sample of tobacco into the upper end of a rotating inclined cylindrical drum, the cylindrical wall of which has a series of longitudinally separated screens, each screen of the series having uniform-sized and shaped openings and the sizes of the openings of the screens increasing substantially regularly from the upper end to the lower end of the drum, separately collecting the fraction of the tobacco pieces that fall through each screen of the drum, weighing each such fraction, calculating the percentage by weight of each fraction, and characterizing the tobacco by the

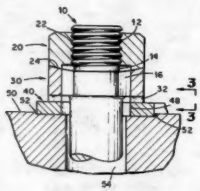
respective slopes of logarithmic plots of the percent by weight of a finer portion and a coarser portion.

6. Apparatus for determining the size distribution of tobacco pieces comprising an open circular cylindrical drum, the cylindrical wall of which is defined by a series of longitudinally spaced-apart screens, each of which has openings of uniform size and shape, and the openings of each successive screen being larger than the openings of the next preceding screen moving from one end of the drum to the other, means mounting the drum for rotation about an axis that slopes downwardly from said one end to the other end and is coincident with the longitudinal axis of the drum, a multiplicity of longitudinally extending equally circumferentially spaced-apart flights affixed to the inside of the drum and adapted to lift successive masses of the pieces upon rotation of the drum, whereupon they fall back to the lower portion of the drum upon further rotation thereof, means for rotating the drum about said axis, and means for separately collecting that fraction of a sample of tobacco fed into the upper end of the drum that falls through the openings of each screen.

H32
STUD HARDWARE WITH SELF-CONTAINED STUD ANTI-ROTATION FEATURE AND METHOD OF INSTALLING STUDS

John S. Kartik, and William M. Richardson, both of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1984, Ser. No. 589,279
Int. Cl.[4] F42B *39/10*
U.S. Cl. 411—120 **21 Claims**



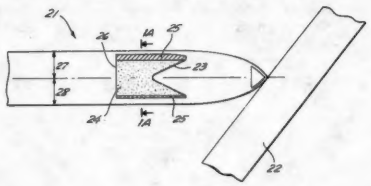
1. An apparatus to prevent rotation of a stud comprising:
- a stud member having a first portion adapted to engage a nut, a second portion adapted to receive a second locking member and a shaft portion adapted to engage a member to be clamped;
- a first locking member adapted to be positioned on said member to be clamped;
- a second locking member which cooperates with said second portion of said stud and said first locking member;
- a nut which engages said first portion of said stud.

14. A method of preloading a stud and preventing the rotation thereof comprising:
- positioning a first locking member over a bore in a member to be clamped;
- inserting a stud member having a first portion to engage a nut member and a second portion to engage a second locking member in register with said bore in said member to be clamped;
- arranging said second locking member having a means for engaging said first locking member on said second portion of said stud;
- threading said nut member onto said first portion of said stud;
- preloading said stud by applying a torque to said nut member.

H33
SHAPED-CHARGE

Robert L. Jameson, Aberdeen, Md., and Steven Segletes, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,877
Int. Cl.[4] F42B *11/22*
U.S. Cl. 102—476 **10 Claims**



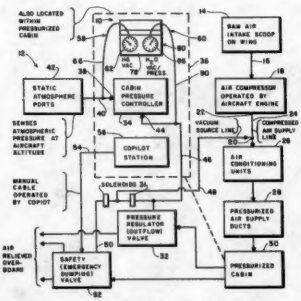
1. In a improved anti-tank warhead for an elongated cylindrical non-rotating projectile symmetrical about a center axis:
- a shaped-charge comprising a generally conical hollow deformable thin-walled metallic liner,
- a generally cylindrical mass of explosive co-axially surrounding said liner, and
- a rigid elongate generally cylindrical wall co-axially surrounding said explosive mass,

the improvement comprising:
- radial asymmetries selected from the group consisting of in said liner, in said explosive mass and in said wall adapted to produce cumulative non-symmetrical force to non-uniformly collapse said deformable liner upon detonation of said explosive mass, to form a jet train of amorphous metal masses from said liner and to accelerate said jet train along a path angularly displaced from said center axis against a target tank defensive armor system.

H34
AIRCRAFT CABIN PRESSURIZATION CONTROL SYSTEM TESTER

Kevin J. Werling, New Haven, Ind., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 19, 1984, Ser. No. 622,047
Int. Cl.[4] C05B *1/00*
U.S. Cl. 73—40.5 R **1 Claim**



1. A portable tester for an aircraft cabin pressure control system including a cabin pressure controller having an inlet operatively connected to a port open to the atmosphere and an outlet operatively connected to a pressure regulator valve for regulating pressure within said cabin, said tester comprising:
- a. a first pressure-indicating gage, a first coupler for interconnection in flow communication with said inlet of said

controller of said control system and a first flexible hose means for connecting said first gage in flow communication with said first coupler for measuring air pressure at said inlet;

b. a second pressure differential-indicating gage, a second coupler for interconnection in flow communication with said outlet of said controller of said control system and a second flexible hose means for connecting said second gage in flow communication with said second coupler for measuring air pressure at said outlet; and

c. a tool box having a lid and a top shelf within which said first and second gages are mounted in side-by-side relationship and readable from outside said box when said lid is open, said first and second flexible hose means being operatively connected to said respective gages from inside said box such that said couplers and flexible hose means can be stored in said box when said tester is not being used.

H35

FREEZE DRIED COOKED MEATS

Daniel Berkowitz, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,899

Int. Cl.[4] A23L *1/317*

U.S. Cl. 426—135 **3 Claims**

1. A method for producing freeze dried cooked meats which are more easily and completely rehydratable, comprising the steps of:

a. trimming a quantity of raw solid meat of heavy connective tissue and excess fat;

b. grinding or emulsifying a first portion of said trimmed meat and flaking or chunking a second portion of said trimmed meat into flakes or chunks which are 2.5–6.0 cubic inches in volume;

c. mixing said ground or emulsified first portion and said flaked or chunked second portion with about 2.0% to about 6.0% of the formula weight water, about 0.5% to about 2.0% of the formula weight salt, about 0.1% to about 0.5% of the formula weight phosphates and about 0.5% to about 5.0% of the formula weight an adjunctive hydrophilic ingredient until sufficient myofibrillar proteins are extracted to render the mixture moderately tacky and continuing said mixing until the water, salt, phosphates and adjunctive hydrophilic ingredients equilibrate throughout said mixture;

d. preparing a meat log by tightly stuffing said mixture into a moisture and gas impermeable container, wherein said container is a casing comprising a fibrous cellulose exterior laminated onto a saran film interior, said casing fitting tightly to the surface of said meat so as to keep moisture in equilibrium within said meat product during cooking;

e. cooking said meat log at a predetermined temperature for sufficient time to achieve a predetermined product center temperature;

f. freezing said meat log;

g. slicing or dicing said meat log into portions suitable for freeze dehydration;

h. freeze vacuum dehydrating said portions to a predetermined moisture level; and

i. packaging said dehydrated meat in an airtight container in the absence of oxygen.

H36

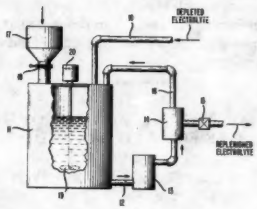
ELECTROPLATING PROCESS WITH INERT ANODES

Craig G. Smith, North Plainfield, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 646,500, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 602,098, Apr. 20, 1984, abandoned, which is a continuation of Ser. No. 521,976, Aug. 11, 1983, abandoned, which is a continuation of Ser. No. 310,611, Oct. 13, 1981, abandoned. This application Apr. 1, 1985, Ser. No. 717,601

Int. Cl.[4] C25D *3/38*; C25B *15/00*

U.S. Cl. 204—52 R **9 Claims**



1. Electrochemical copper deposition process comprising passing current between an anode and a cathode, both anode and cathode being maintained in contact with an aqueous electrolyte in a plating tank, the electrolyte comprising Cu ions, the electrolyte contained in the plating tank to be referred to as the plating bath, the process also comprising adding Cu ions to the plating bath,

CHARACTERIZED IN THAT

the anode is an anode of the nonconsumable type and the Cu ions are added to the plating bath by a procedure comprising contacting CuO powder with electrolyte.

H37

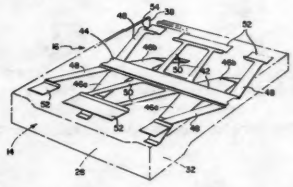
FILM PACK HAVING IMPROVED PACK SPRING

Anthony J. Schettino, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 3, 1985, Ser. No. 740,724

Int. Cl.[4] B65D *85/38*

U.S. Cl. 206—316 **4 Claims**



1. A pack spring for use in a film pack of the type for use in photographic apparatus of the self-developing type wherein the pack includes a film cassette assembly having a space which stores a stack of film units, an aperture in operative relationship with each topmost film unit in the stack so that successive topmost units can be exposed, and an exit slot in adjoining cooperative relationship with each topmost film unit so as to allow exiting of exposed topmost units; and

a stack of film units of the self-developing kind, wherein each of said units includes an image forming area bordered by a frame having a rupturable pod of procesing fluid along one marginal edge of the unit and a trap for receiving processing fluid which has been spread over the image area along a second opposite marginal edge; said pack spring comprises:

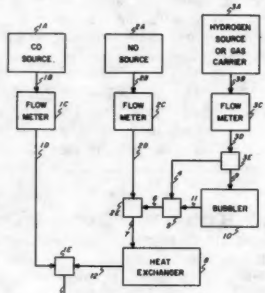
means for yieldably supporting the stack upwardly so that

successive topmost units are urged into operative relationship with the aperture in a generally flat condition, said supporting means including a central supporting bar which supports centrally the image areas of the stacked units; yieldable arm assemblies extending in opposite directions from said bar wherein said assemblies support evenly the image forming area of the film adjacent the pod and the trap as well as the pod and the trap so that respective ones of said marginal edges are in the same general plane as the image area when the nut is at least the topmost; and a pair of yieldable leg assemblies each extending in opposite directions from said bar which contact the cassette assembly so as to support the load of stacked units in a manner which avoids lateral twisting of said bar about its longitudinal axis, whereby the image area, the pod and the trap are generally flat and can be advanced through said exit slot.

H38
PROCESS FOR THE PREPARATION OF UREA AND ITS DERIVATIVES FROM CO, NO, AND A HYDROGEN SOURCE

Robert J. Radel, and Yong K. Kim, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jul. 15, 1985, Ser. No. 754,555
Int. Cl.[4] C07C *126/00, 127/01*
U.S. Cl. 564—63 **9 Claims**

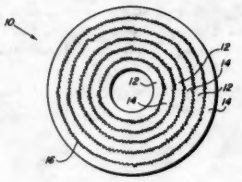


1. A process for the production of urea and its derivatives by reacting CO, NO, and a hydrogen source in the vapor phase, at temperatures of about 75° C. to 225° C. and at pressures of about 1 atmosphere in contact with a catalyst comprising a noble metal selected from the group consisting of palladium, rhodium, and mixtures thereof on an inert support.

H39
MULTILAYER SUPER-CONDUCTING SHIELD AND METHOD OF MANUFACTURING SAME

Donald U. Gubser, Fairfax, Va., and Stuart A. Wolf, Greenbelt, Md., assignors to The Government of the United States, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,365
Int. Cl.[4] H05K *9/00*; C23C *14/24*; H01L *39/12, 39/24*
U.S. Cl. 204—192 S **16 Claims**



1. A multilayer superconductor shield which comprises:
alternating concentric layers of a transition metal having a high transition temperature and a metal alloy formed from copper and a non-transition metal, said transition metal and metal alloy forming an interface; and
a layer of A_3B-compound structure metal at the interface of said metals, said A_3B-compound structure metal being a high transition temperature superconductor.

10. A method of manufacturing superconducting shields of transition metals having high transition temperatures for use in magnetic shielding applications by the process of reactive rf sputtering, comprising the steps of:
providing a clean conventional vacuum sputtering chamber, said chamber prepumped to a pressure of approximately 3×10^{-9} torr;
backfilling said vacuum chamber with high purity argon to a pressure of approximately 50×10^{-3} torr;
providing a sputtering target of niobium;
suspending a rotatable substrate within said vacuum chamber; and
igniting the aron to start the reacting process;
injecting nitrogen into the vacuum sputtering chamber thereby depositing niobium nitride onto said rotating substrate, said niobium nitride deposited at a power density of about 15 watts$-$cm^{-3} to a thickness of approximately 1 micron.

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 4, 1986

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T106,201
MASTER IMAGE CHIP ORGANIZATION TECHNIQUE OR METHOD

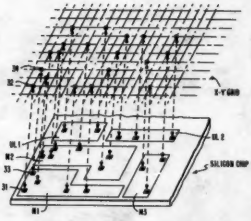
John Balyoz, Deerwood Dr., Box 247, R.D. #3, Hopewell Junction, N.Y. 12533; Chi S. Chang, 14 Shale Dr., Wappingers Falls, N.Y. 12590; Barry C. Fox, 26 Miron Dr., Poughkeepsie, N.Y. 12603; John A. Palmieri, 10 Montfort Woods Rd., Wappingers Falls, N.Y. 12590; Majid Ghafghaichi, 352 Vassar Rd., Poughkeepsie, N.Y. 12603; Teh-Sen Jen, 66 Star Mill Rd., Fishkill, N.Y. 12524, and Donald B. Mooney, 26 Hagan Dr., Poughkeepsie, N.Y. 12603

Continuation of Ser. No. 224,240, Jan. 12, 1981, abandoned, which is a division of Ser. No. 974,576, Dec. 29, 1978, Pat. No. 4,295,149. This application Jan. 13, 1983, Ser. No. 457,786

Int. Cl.[4] H01L *21/88*

U.S. Cl. 29—577 C

15 Sheets Drawing. 82 Pages Specification



A method for forming an improved integrated circuit chip structure having a surface from which regions of different conductivity type are arranged in a plurality of electrically isolated macro circuits, each macro circuit including interconnected components, a first X pattern of equally spaced parallel conductors overlying and electrically insulated from said chip structure surface, said first X pattern of conductors being selectively connected to at least certain ones of said plurality of macro circuits, a second Y pattern of equally spaced parallel conductors overlying and electrically insulated from said first pattern of parallel conductors, said second Y pattern of conductors being selectively connected to at least selected certain ones of said first pattern of electrical conductors, said spacing one from another of said first X pattern of conductors being equal to said spacing one from another of said second Y pattern of conductors, said first pattern of conductors being orthogonal of said second pattern of conductors, and each of said connections occurring exclusively at points in space corresponding to X-Y intersections of an X-Y coordinate system, where said X-Y coordinate system geometrically corresponds identically to said X-Y pattern of conductors.

T106,202
HIGH CONCENTRATION METERED AEROSOL ANTIPERSPIRANT PRODUCT

Leonard Mackles, 311 E. 23rd St., New York, N.Y. 10010

Continuation of Ser. No. 23,808, Mar. 26, 1979, abandoned. This application Sep. 30, 1983, Ser. No. 537,541

Int. Cl.[4] A61K *9/14*

U.S. Cl. 424—46

No Drawing. 26 Pages Specification

An article of manufacture comprising a metered aerosol container having incorporated therein an antiperspirant material, in high concentration suspended in an oily vehicle and containing relatively low levels of propellant.

REISSUES

MARCH 4, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,089

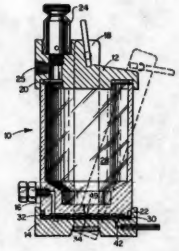
BLOOD FRACTIONATING PROCESS AND APPARATUS FOR CARRYING OUT SAME

William F. Blatt, Framingham; Edward A. Agranat, Weston, and Peter N. Rigopulos, Melrose, all of Mass., assignors to Amicon Corporation, Lexington, Mass.

Original No. 3,705,100, dated Dec. 5, 1972, Ser. No. 66,675, Aug. 25, 1970. Application for reissue Feb. 17, 1981, Ser. No. 235,093

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 **4 Claims**



5. A process for separating blood plasma from the other components of blood *without substantial hemolysis* comprising the steps of

(1) conducting whole blood in a flow path which is substantially parallel to the upstream side of a filtration membrane and has a maximum depth of 20 mils measured vertically from the face of the membrane, said membrane having a pore size from about 0.1 to about 0.8 micron in diameter,

(2) applying sufficient pressure to said whole blood to cause *a* pressure differential from 1 to 15 p.s.i. between upstream and downstream sides of said membrane and to provide a flow velocity across the face of the membrane from 2 to 50 feet per minute,

(3) recovering plasma ultrafiltrate from the downstream side of said membrane, and

(4) recovering the retained blood components from the upstream side of the membrane,

said plasma ultrafiltrate being substantially free of evidence of hemolysis.

Re. 32,090

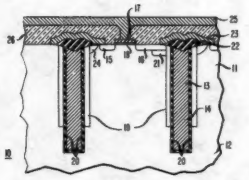
SILICON INTEGRATED CIRCUITS

Ralph J. Jaccodine, Allentown, Pa., and John A. Michejda, Berkeley Heights, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,353,086, dated Oct. 5, 1982, Ser. No. 147,466, May 7, 1980. Application for reissue Oct. 5, 1984, Ser. No. 658,189

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—51 **11 Claims**



1. A memory comprising a plurality of memory cells arranged in an array of rows and columns, each memory cell including an access transistor and a storage capacitor serially connected, comprising a monocrystalline silicon chip which is grooved to form a plurality of individual mesas **(11)** arranged in columns and rows

characterized in that

polycrystalline doped silicon **(14)** fills the grooves **(13)** and is isolated from the mesas by a dielectric layer **(20)**, a separate access transistor is formed on the surface of each mesa, and a separate storage capacitor is associated with each mesa, one plate of the capacitor being formed by a *surface* layer **(19)** on the sidewall of the mesa and the other plate by the polycrystalline silicon fill **(14)**, and the sidewall layer including a low resistance connection to a source/drain region of the surface access transistor.

PLANT PATENTS

GRANTED MARCH 4, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,676

MINIATURE ROSE PLANT/VAR: MORWHY

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Aug. 10, 1984, Ser. No. 640,083
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit substantially as illustrated and described, characterized by open (7–9 petals) flowers which are bright red in color, with a large yellow "eye", the reverse side of petals being yellow or yellow blend, the buds and flowers resembling the shrub rose Cocktail in form and color but smaller in size; and further characterized by a plant which is vigorous and compact, easy to propagate from soft wood cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

5,677

MINIATURE ROSE PLANT *MINJCO'*

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed May 2, 1984, Ser. No. 606,397
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are of light pink (to coral pink) coloring, the buds and flowers resembling Over the Rainbow (miniature — U.S. Plant Pat. No. 3,472) in form and size, produced on a plant of compact growth habit; and further characterized by (1) a plant which is easy to propagate from soft wood cuttings and (2) a plant with deep green, glossy, disease resistant foliage, with an abundance of flowers usually borne singly on slender wirey stems.

5,678

ROSE PLANT KORPERKI

Reimer Kordes; Werner Kordes, and Hermann Kordes, all of Klein Offenseth-Sparrieshoop, Fed. Rep. of Germany, assignors to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 17, 1984, Ser. No. 651,520
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—21 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous spreading, medium height plant, dark red buds and blooms with pointed petals, little fragrance, curled leaflets.

5,679

ROSE PLANT KORENLO

Reimer Kordes; Werner Kordes, and Hermann Kordes, all of Klein Offenseth Sharrieshoop, Fed. Rep. of Germany, assignors to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 17, 1984, Ser. No. 651,680
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—26 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its ability to produce large quantities of cut blooms of mottled pink and white color, heavy petals, little fragrance on long rigid stems.

5,680

GRAPEVINE—MARS CULTIVAR

James N. Moore, Fayetteville, Ark., assignor to University of Arkansas Agricultural Experiment Station, Fayetteville, Ark.

Filed Jul. 5, 1984, Ser. No. 628,142
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—47 1 Claim

1. A new and distinct variety of grapevine, substantially as illustrated and described, characterized by its early ripening, large seedless fruit, and outstanding resistance to common grape fungus pathogens.

5,681

HIBISCUS PLANT

Joseph E. Ludick, 13095 NE. 2nd Ave., North Miami, Fla. 33161

Filed Feb. 9, 1984, Ser. No. 578,478
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of hibiscus plant, of Rosa-sinensis species, substantially as herein described and illustrated, and characterized particularly as to novelty by its vigorous, upright habit of growth, its crisp green foliage, and its brilliant flowers.

5,682

CAMELLIA CHRYSANTHA OLYMPIC GOLD

Meyer Piet, 15430 Proctor Ave., City of Industry, Calif. 91747

Filed May 24, 1984, Ser. No. 613,725
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—60 1 Claim

1. A new and distinct species of camellia plant as shown and described, characterized particularly by its unique flower which has a true yellow color.

PATENTS

GRANTED MAR. 4, 1986

ERRATA

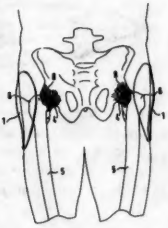
For CLASS	See PATENT NO.
241–169	4,573,244
425–040	4,574,098

PATENTS

GRANTED MARCH 4, 1986

GENERAL AND MECHANICAL

4,573,216
IMPACT DISSIPATOR
Walter Wortberg, Buschhauser Weg 13b, 5880 Ludescheid, Fed. Rep. of Germany
Filed Jul. 8, 1983, Ser. No. 512,020
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 8219790[U]; Feb. 17, 1983, 3305408
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **7 Claims**



1. An impact dissipator for protection of the human body, comprising:

(a) an outer layer consisting of cross-linked silicone rubber;

(b) an inner viscous-like fluid layer consisting of partially cross-linked silicone rubber integrally bonded to said outer layer at the interface thereof, said inner layer having an adhesive skin-friendly surface adapted to tightly contact the skin of the wearer and conform to the external shape of the body in the region to be protected, and wherein

(c) said outer and integrally bonded inner layers are generally oval in shape and bell-shaped in cross-section, with the maximum thickness of the bonded layers being in the area contacting the region of the body to be protected.

4,573,217
PROTECTIVE HOOD FOR FIREFIGHTERS
Clifford C. Reed, Rte. 6, Box 522, Arcadia, Tex. 77517
Filed Jul. 30, 1984, Ser. No. 635,810
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—7 **16 Claims**

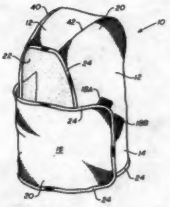
1. A protective hood adapted for use with a face mask by a firefighter, comprising:

a fire resistant head portion adapted to cover the forehead and ears of the firefighter,

a fire resistant lower marginal portion extending sufficiently below said head portion to cover the lower neck of the firefighter,

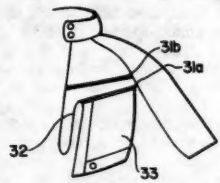
a fire resistant flap permanently attached to said head portion and said lower marginal portion on one end of said flap, said flap extending sufficiently below said head portion to cover the chin and the neck of the firefighter, and

non-metallic and fire resistant means for adjustably and releasably fastening the other end of said flap to said head



portion and said lower marginal portion, whereby said flap can be adjusted to securely overlap the face mask, and whereby the protective hood in cooperation with the face mask aids in the protection of the chin, head, face and neck of the firefighter.

4,573,218
CONVERTIBLE LENGTH GARMENT
Gordon J. Saggs, 115 E. 9th St., New York, N.Y. 10023
Filed Jul. 30, 1984, Ser. No. 635,891
Int. Cl.[4] A41D *1/02, 1/00, 27/10*
U.S. Cl. 2—93 **10 Claims**



1. A garment which is a combined jacket and raincoat of flexible and attached panels which may be readily repeatedly and rapidly lengthened to form the raincoat or shortened to form the jacket by the user, the garment including:

a top garment portion having a lower edge with a circumference and including front and back panels and sleeves attached thereto;

a bottom garment portion having an upper edge with the same circumference as the circumference of the said lower edge, including front and back panels;

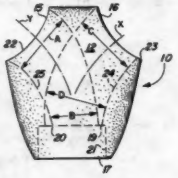
a lengthening panel attached to and between said top and bottom portions and which is foldable and unseen when the garment is shortened and which is unfolded, seen and adds to its length when the garment is unfolded, said lengthening panel extending circumferentially about the garment; and

a zipper extending continuously and circumferentially about the garment and having one side attached to the lower edge of the top portion and its other side attached to the upper edge of the bottom portion so that when the zipper is closed the lengthening panel is folded unseen behind the bottom portion and the zipper is viewable on the exterior of the jacket.

4,573,219
NECKTIE KNOT SIMULATOR

Howard G. Hooten, Indian Hill Dr., P.O. Box 288, Dewey, Ariz. 86327

Filed Jun. 3, 1985, Ser. No. 740,812
Int. Cl.[4] A41D *25/08, 25/04*
U.S. Cl. 2—152 R 1 Claim



1. A knot simulator for a four-in-hand necktie, which necktie comprises an elongate strip of fabric which is normally worm by wrapping a portion of the necktie intermediate the free ends thereof around the wearer's neck under the collar of his shirt, forming a knot in the general shape of an inverted, truncated triangle in the portions of the free ends of said necktie extending just past the wearer's collar, allowing said free ends to extend downwardly therefrom in overlapped relationship, said knot simulator comprising

(a) a body in the general shape of an inverted, truncated triangle and having

(i) an upper portion,

(ii) a lower portion,

(iii) front, side and rear surfaces generally shaped, contoured and dimensioned such that said surfaces corresond to and simulate the front, side and rear surfaces of a four-in-hand necktie knot,

(iv) first and second spaced apart generally opposed sloped shoulder surfaces on said upper portion of said body contiguous to said front, side and rear surfaces,

(v) first and second apertures formed through said first and second shoulder surfaces, respectively, and

(vi) a third aperture formed in said bottom portion of said body;

(b) a first arcuate channel extending through said body from said first aperture to said third aperture and shaped, contoured and dimensioned to permit one of said free ends to pass therethrough such that said body can be slidably moved up and down along a first intermediate portion of said tie; and,

(c) a second arcuate channel extending through said body from said second aperture to said third aperture and shaped, contoured and dimensioned to permit the other of said free ends to pass therethrough such that said body can be slidably moved up and down along a second intermediate portion of said tie, said second arcuate channel passing through said body in overlapping relationship with said first arcuate channel.

4,573,220
BILLIARD GLOVE

Terry L. Baker, P.O. Box 206, Armuchee, Ga. 30105

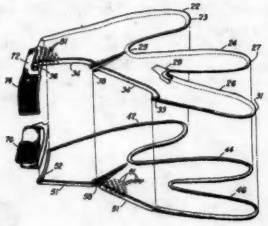
Filed Aug. 17, 1984, Ser. No. 641,867
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A 5 Claims

1. Glove means for use in billiards comprising:

a first member having edges defining a thumb portion, an index finger portion, a middle finger portion, and hand portion,

a second member with edges in mirror symmetry to said first member and having corresponding thumb, index finger, middle finger, and hand portion,

said hand portions having straight edge portions and wherein each of said hand portions is formed with a slit opening at about the middle of at least one of the straight edge portions, said slit opening extending at right angles thereto in close proximity to the junction between the thumb and index finger portions, each of said slit openings being stitched separately to close said openings,



said first and second members being stitched together by straight stitches along the edges extending between the thumb and middle finger portions but remaining unstitched in the straight edge portions of said hand portions so that a smoothly fitted glove is made for right and left hand use of a billiard player.

4,573,221
STRAP WITH CONNECTING PART

Hermann Hirsch, Hirschstrasse 5, 9021 Klagenfurt, Karnten, Austria

Filed Jul. 23, 1984, Ser. No. 633,394
Claims priority, application Austria, Jul. 21, 1983, 2676/83
Int. Cl.[4] A41F *3/02*
U.S. Cl. 2—338 7 Claims

1. In a strap consisting of face material and lining wherein the face material and the lining are separate pieces of leather or simulated leather and are joined together, and wherein a connecting part of a rigid material, such as a metal or synthetic resin, is joined to the strap at at least one end thereof; the improvement comprising a flexible tension-relief member (4) affixed between the face material (6) and the lining (7) of the strap and connected with a section of the connecting part (1) extending between the face material (6) and the lining (7).

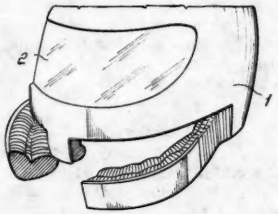
4,573,222
CRASH HELMET

Giovanni Zago, via N. Aprilis, 41, 33080 San Quirino, Italy

Filed Mar. 19, 1984, Ser. No. 591,085
Claims priority, application Italy, Mar. 30, 1983, 41544 A/83
Int. Cl.[4] A42B *1/08*
U.S. Cl. 2—424 6 Claims

1. A crash helmet having a helmet shell with a front base portion, a nape base portion and between the front base portion and the nape base portion a pair of opposite side base portions, said front base portion, said pair of side base portions and said nape base portion defining a base opening of the helmet shell, said opposite side base portions and part of said front base portion being upwardly recessed with respect to said nape base portion, to define opposite side wall recesses in said helmet shell, a resiliently flexible split ring member arranged below and coextensive with said opposite side portions, said nape base portion and part of said front base portion, and having a split

adjacent said front base portion, said split ring member having a nape facing section coextensive with said nape base portion and opposite jaw facing sections extending from said nape facing section and ending at said split and coextensive with said opposite side base portions and part of said front base portion, said split ring member having a width dimension in a direction substantially perpendicular to said base opening, said width dimension being greater at said nape facing section thereof as



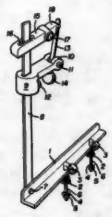
compared to the width dimension thereof at said opposite jaw facing sections, said split ring member having a core in the form of a lamina of resilient material coextensive with said jaw facing sections and said nape facing section thereof, said split ring member having said nape facing section thereof retained in the nape base portion of said helmet shell and wherein said split ring member has at least internal paddings and being resiliently flexible from a closed configuration thereof into an open configuration thereof and viceversa.

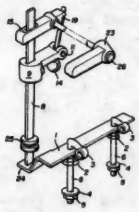
4,573,223

AUTOMATIC TOILET TANK RELEASE

Richard B. Schmidt, Sky Harbour E. Apt. 2K, Fort Lauderdale, Fla. 33316

Filed Jun. 19, 1985, Ser. No. 746,507
Int. Cl.[4] E03D *5/04, 11/10, 1/18*
U.S. Cl. 4—408 **5 Claims**





1. A toilet seat activated automatic flushing linkage functioning to automatically flush a reservoir type toilet when the user lifts his weight from said toilet seat comprising:

a toilet seat holder having springs mounted on said toilet wherein said springs exert upward pressure on said holder after a user removes his weight from said toilet seat;

a primary vertical rod affixed to said holder;

a vertical guide means for said primary vertical rod;

an actuating assembly affixed to said primary vertical rod further comprising a pivoting secondary vertical rod which has a counterweight at its lower tip;

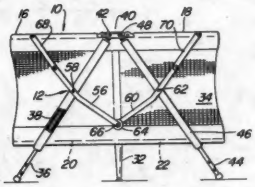
a flushing lever working in cooperation with said actuating assembly.

4,573,224

FOLDING PLAYPEN

David Saint, Elverson, Pa., assignor to Graco Metal Products Inc., Elverson, Pa.

Filed Jun. 1, 1984, Ser. No. 616,107
Int. Cl.[4] A47D *13/06*
U.S. Cl. 5—99 C **9 Claims**



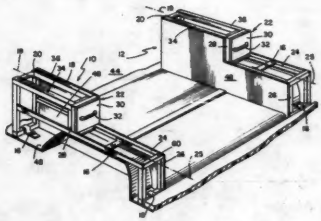
1. A folding playpen comprising two pairs of leg frames movable between extended and collapse positions, upper and lower U-shaped frame portions pivoted together, a flexible fence extending between said frame portions, a platform having pivotable sections, means for causing said frame portions and platform sections to pivot in opposite directions as said leg frames move between their associated positions, said means including meshed gear means on at least one of said pairs of leg frames.

4,573,225

CONVERTIBLE SEAT-BED AND STORAGE UNIT

Robert Wolf, 48461 Bayshore Dr., Belleville, Mich. 48111

Filed May 9, 1984, Ser. No. 608,357
Int. Cl.[4] A47C *17/12;* **B60N** *1/10*
U.S. Cl. 5—118 **22 Claims**



1. A convertible seat-bed and storage unit comprising:

a. a pair of spaced apart and opposed frame elements, each of said frame elements having means for supporting a panel at a first level of support extending in a generally horizontal plane from a first end of said element to a transition region, and having means for supporting a panel at a second level of support, extending from a second end of said element to said transition region, and having means on said frame elements for extending said first level of support from said transition region to said second end;

b. a primary storage area located between said frame elements and below said first level of support and extending from said first end toward said transition region;

c. a first panel supported by said frame elements and extending between said transition regions of said frame elements in a generally vertical plane, said first panel being movable from said vertical plane to a generally horizontal plane at said first level of support when said seat-bed is converted to a bed configuration; and

d. a second panel extending between and supported by said frame elements at said second level of support when said seat-bed is in said seat configuration, said second panel being movable to said first level of support when said seat-bed is converted to said bed configuration.

4,573,226

INSERT FOR A PIECE OF LOUNGING FURNITURE

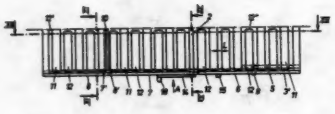
Franz Wittmann, No. 205 Kellergasse, and Karl Wittmann, No. 227 Kellergasse, both of A-3492 Etsdorf am Kamp, Austria

Filed Jan. 16, 1984, Ser. No. 570,894

Claims priority, application Austria, Feb. 2, 1983, 352/83

Int. Cl.[4] A47C *23/06*

U.S. Cl. 5—236 R **23 Claims**



1. An insert for a piece of lounging furniture having a frame comprising longitudinal parts and slats, the slats being arranged transversely in relation to the longitudinal parts and spatially measured in a horizontal direction for forming a slat grate extending over an entire reclining surface, said slats being connected to said longitudinal parts and being arranged in at least two superposed rows vertically spaced from one another with the slats of superposed rows being staggered in relation to one another in horizontal and vertical direction in such manner that in plan view the slats of the different superposed rows are also disposed spatially apart in a horizontal direction, with all the slats being resilient and the slats of each upper row having greater resilience than the slats of each lower row, said longitudinal parts being provided with bearings of elastic material in which the ends of the slats are supported, with the ends of the slats of the various rows also being spaced from one another measured in vertical direction within the range of the supporting bearing.

4,573,227

BLANKET ASSEMBLY COMPOSED OF AT LEAST TWO INTERCONNECTABLE BLANKETS, FOR SINGLE AND DOUBLE BEDS

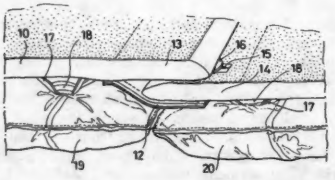
Aldo F. Prandina, Busto Arsizio, Italy, assignor to Ing. Loro Piana & C. S.p.A., Quarona Sesia, Italy

Filed May 7, 1984, Ser. No. 607,447

Claims priority, application Italy, May 5, 1983, 53285/83[U]

Int. Cl.[4] A47G *9/02, 9/04*

U.S. Cl. 5—486 **3 Claims**



1. A blanket assembly composed of interconnectible blankets for single and double beds comprising at least two rectangular elongated single bed blankets, each having on one of its longer edges a flap attached thereto at a distance from the end of that edge, so as to constitute together with the end portion of that edge an open pocket, said flap having buttons along the side facing said edge, and the opposite longer edge of each blanket having buttonholes disposed at spaced locations corresponding to the locations of said buttons on said flap so as to allow joining together two such blankets in such a way that the edge provided with buttonholes of a blanket is inserted between the flap and the edge provided with said flap of another blanket, said buttonholes being formed in and extending entirely through the same material as the material of the blanket between said edges, whereby two full thicknesses of said material overlap with said buttons between them.

4,573,228

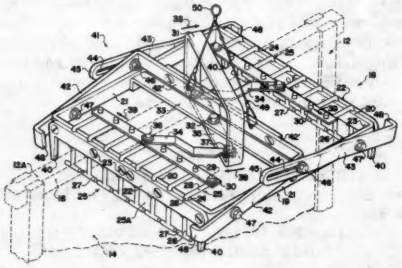
LIFTING DEVICE FOR REMOVING HONEY COMB ASSEMBLIES FROM SUPERS

Larry E. Bachalo, R.R. #1, Box 71, Portage La Prairie, Manitoba, Canada R1N 3A1

Filed Nov. 19, 1984, Ser. No. 672,687

Int. Cl.[4] A01K *59/00*

U.S. Cl. 6—12 R **20 Claims**



1. A lifting device for lifting a plurality of honey-filled combs from a super at the same time, each said combs including top bars, said super including an upper perimetrical wall edge; comprising in combination a substantially rectangular frame assembly capable of spanning the upper perimetrical wall of the super, said frame assembly including a pair of spaced and parallel transverse side bars, a plurality of double sided hook elements pivoted, in side by side relationship, for partial rotation within said side bars and extending below said side bars, means mounted in said frame assembly and being operatively connected to said hook elements, for moving each of said hook elements simultaneously and selectively between adjacent comb top bars and from between a comb top bar engaging position and a comb top bar disengaging position, and means on the ends of said side bars to locate and align said lifting device upon said top bars of the outermost combs.

4,573,229

SIDE AND HEEL LASTING MACHINE

Anthony F. Moreira, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

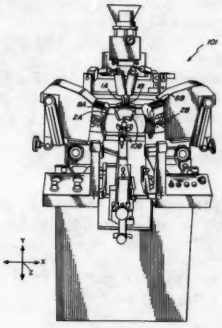
Filed Jul. 30, 1984, Ser. No. 635,987

Int. Cl.[4] A43D *21/12, 21/00*

U.S. Cl. 12—8.1 **3 Claims**

1. For use in a footwear forming machine, operable on a footwear assembly having a last with an upper mounted thereon and an insole upwardly oriented thereon with the toe portion of the upper margin wiped against and secured to the insole and unwiped margin portions of the upper extending heelwardly of the wiped margin portions, which unwiped margin portions extend upwardly at an open angle to the in-

sole, said machine including means for applying adhesive in the region between said upwiped margin portions and the corresponding portions of the insole at said region, a lasting mechanism operable to clamp the upper tightly against the last and to apply backup pressure for the unwiped margin to support the same, but nevertheless maintaining the open angle between the unwiped margin portions and the insole to permit application of adhesive into said region, said lasting mechanism comprising a lasting pad at each side of the footwear assembly, each lasting pad being made of an elastic, flexible and deformable material, the top end of each lasting pad being formed into a plurality of relatively rigid segments, said lasting mechanism further including actuator means to press the lasting pad at each side of the footwear assembly against the side of the footwear assembly in order to press the upper against the last towards the insole edge line and to apply said backup pressure while maintaining said open angle, said actuator means including a plurality of actuator elements, each being associated with a corresponding relatively rigid segment, to apply linear inward-directed forces upon the associated relatively rigid segment to apply said backup pressure during the application of adhesive into the region and to apply high wiping forces on the associated relatively rigid segment, subsequent to the application of the adhesive, to fold the margin onto the insole to press the adhesive between the margin and the insole to adhere the margin onto the insole, wherein each actuator element comprises a rod having a clevis at its free end with an aperture in each leg of the clevis and said associated relatively rigid segment having an apertured shoulder rigidly secured as an integral part thereof, said shoulder being received between the legs of the clevis, the aperture of the shoulder being registered with the aperture of each leg of the clevis to receive a pin to pivotally retain the shoulder therein during lasting and to permit inwardly directed forces to be transmitted to the lasting pad, said shoulder, in the course of wiping, pivoting about the pin to provide downwardly-directed forces on the margin being wiped.



4,573,230

VERTICALLY MOVING MECHANISM FOR ROTOR BRUSH IN MANUAL CLEANER

Kimihiro Saeki, Kashiwa, and Kiyoshi Kobayashi, Noda, both of Japan, assignors to Hukuba Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1984, Ser. No. 607,221

Claims priority, application Japan, May 30, 1983, 58-81670[U]

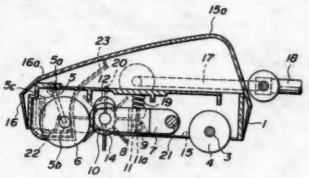
Int. Cl.⁴ A47L *11/33*

U.S. Cl. 15—41 R **2 Claims**

1. A mechanical cleaner comprising

a main casing having driving wheels and an open bottom, said wheels projecting downward from said open bottom and being rotatable, a rotatable brush driven by said wheels and adapted to brush dust from a carpet or floor into a dust box on said main casing.

vertically movable means for releasably mounting said brush comprising a pair of swinging frames one end of each of which is rotatably journaled on said casing at a point spaced apart from the other frame, said brush being



rotatably mounted between the other ends of said frames, said frames being urged downwardly by at least one urging means, at least one engaging means on said casing and adapted to releasably engage said frames, whereby releasing said engaging means permits said frames carrying said brush to rotate downwardly to allow said brush to be detached from said frames.

4,573,231

PIPE CLEANING DEVICE

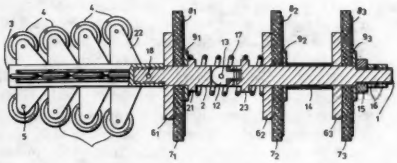
Peter Stocksiefen, Asbach, and Alfons Grüber, Linz, both of Fed. Rep. of Germany, assignors to Industrietechnik Kalenborn GmbH, Kalenborn bei Linz, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,078

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1983, 3312958

Int. Cl.⁴ B08B *9/04*

U.S. Cl. 15—104.06 R **10 Claims**



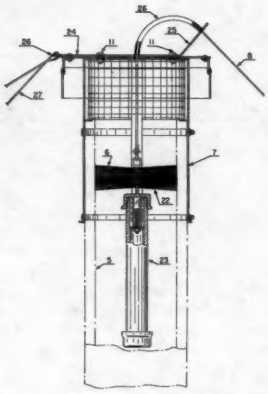
1. A pipe cleaning device for removing encrustations from pipelines, more particularly pipelines conducting water, foul water or water for mining purposes, comprising a propulsion element which can be moved by hydraulic pressure through the pipeline, said propulsion element comprising spaced outer, central and inner collars, an impact shaft, said central and outer collars being slidably mounted on said impact shaft, a guide shaft, said inner collar being secured on said guide shaft, means for pivotally coupling one end portion of said guide shaft to one end portion of said impact shaft, a cutting head which is fitted with a plurality of spaced cutting wheels and supported on the other end portion of said guide shaft, said collars substantially spanning the cross-sectional area of the pipeline, characterized in that, between the central and inner collars, there is slidably positioned on the coupled end portions of said shafts, a preloaded spring, each of said three collars being provided with spaced radial incisions for accommodating the passage of fluid applied under pressure to said outer collar, whereby initial application of the hydraulic pressure to said outer collar will transmit an impact to said central collar to further compress said preloaded spring, which in turn applies an impact to said inner collar to drive said cutting head further into said pipeline.

4,573,232

MECHANICAL CHIMNEY SWEEP CONTROL

Clement F. Marley, R.R. 2 Box 165, Nokomis, Ill. 62075

Filed Sep. 17, 1984, Ser. No. 651,169
Int. Cl.[4] F23J *3/00*
U.S. Cl. 15—163 **3 Claims**



1. A device for controlling a brush in a remotely controlled flue cleaner comprising a support means adapted to be secured to the upper outlet of the flue and to extend above the flue for supporting and retaining said brush in alignment therewith and generally centered thereover, a flange member including a pair of upstanding walls connected together at their bottom portions, said portions being connected to the top surface of said support means by bolt means, said two-walled flange member being spaced close together with only enough width between them to allow easy passage of an appropriate sized cable, a series of pairs of bolts extending through the walls of the flange member so as to permit easy passage of said cable, said series of bolts being arranged in a semi-circular pattern on one end of said flange member so as to form a race for passage of said cable and to transfer a downward pull on said cable to an upward pull on the brush, said support means having a bonnet means to keep out the weather, said bonnet means being connected to the bottom surface of said support means such that said bonnet means is located below said two-walled flange member, and means for anchoring the flange from the opposite end of the flange member so that the upper sections of the flue are not pulled over or not out of alignment when an operator is applying pressure to clean the flue.

4,573,233

PAINT ROLLER ASSEMBLY FOR PAINTING CHAIN LINK FENCES AND SIMILAR STRUCTURES

Charles W. Stoop, 1598 NE. 172 St., North Miami Beach, Fla. 33162

Filed Dec. 31, 1984, Ser. No. 687,721
Int. Cl.[4] B05C *1/08*
U.S. Cl. 15—230.11 **14 Claims**

1. A paint roller assembly of the type primarily designed to paint a chain link structure formed of interengaging wire strands, said roller assembly comprising:

(a) a base having a substantially cylindrical configuration and rotatably mounted on a handle means extending outwardly from said base in supporting relation thereto for positioning said base during painting,

(b) a roller cover assembly mounted on an outer surface of said base in covering relation thereto and secured to said base so as to rotate therewith,

(c) said roller cover assembly comprising a base cover having an elongated, tubular configuration and mounted on said base in surrounding relation thereto and extending the length thereof,

(d) said roller cover assembly further comprising a plurality of roller segments each having an annular configuration of continuous length and being disposed in successively adjacent, spaced relation to one another and in surrounding, outwardly extending relation to said base cover,

(e) a plurality of seams each disposed between two adjacently positioned segments and at least partially defined by correspondingly disposed peripheral edges of said adjacently positioned segments,

(f) each of said seams having an annular configuration and each being further defined by an undercut portion integrally formed on at least one of said peripheral edges defining each seam, and

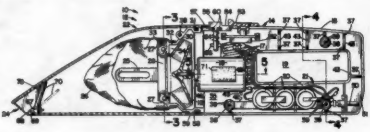
(g) each of said seams comprising an interior surface dimensioned and configured for disposition in substantially surrounding and engageable relation to wire strands entering said seams.

4,573,234

HAND-HELD VACUUM CLEANER

Werner W. Kochte, Ravenna, and Paul K. Meeker, Kent, both of Ohio, assignors to The Scott & Fetzer Company, Twinsburg, Ohio

Filed Jan. 30, 1984, Ser. No. 575,028
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—323 **28 Claims**



1. A battery powered hand-held vacuum cleaner comprising a first unit including a housing enclosing motor, fan and batteries and having power switch means for controlling the motor and vent means for exhausting air, and a second unit partially covering and projecting in front of the first unit and including a hollow dustreceiving cup upstream of the fan, an intake mouth at the front end of the cup, the spatial relationship and geometry of the elements of the sweeper units being defined in reference to the operational orientation of the sweeper when a front to rear axis of the sweeper is generally horizontal and the intake mouth is arranged to effectively sweep a horizontal surface, said units being connected by releasable latch means, a stationary fan intake throat at the front end of said housing and communicating with the interior of the dust cup, a stationary fan cover extending outwardly and rearwardly from the fan intake throat to the remainder of said housing, sealing means between respectively the outer and inner peripheries adjacent respectively the front and rear ends of the first and second units for sealing against air by-pass or leakage between said units or from the exterior to either of said units, said releasable latch means being located in the first unit rearwardly of said sealing means whereby the interengaging and moving parts of said releasable latch means are protected from dust caught within said second unit, storage bracket means mountable on a wall for engaging and storing the cleaner in upright position with said intake mouth pointed upward, said bracket means including a base and a pair of re-entrant flanges spaced outwardly from said base, said first unit tapering rearwardly for a

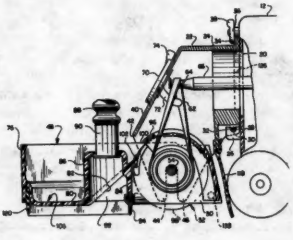
majority of its length but with two grooves formed therein, said flanges keying into said grooves when said rearwardly tapered length of the first unit is lowered over said bracket means, power connector socket means at the rear end of said first unit, upwardly facing plug means mountable in fixed position on the bracket means at the bottom end thereof and adapted to engage in said socket means when the first unit is lowered over the bracket means to be engaged thereby, a wall-mountable charger connected to said plug means by a power line, said plug means being liftable from its mounting when said first unit is raised from said interengagement to allow said plug means, power line and charger to be removed from association with said bracket and used with said cleaner independently of said bracket means, a dust bag hanger extending from one or more sides of the fan intake throat into the interior of the dust cup, a dust bag mounted to extend from the front end of the housing into the interior of the dust cup in covering relationship with the hanger and having an open bag mouth presented toward the fan intake, and means for holding the bag in mounted position, a re-entrant lip extending across said intake mouth at its bottom side, said lip being faired to slant upwardly and inwardly, to an inner shoulder, a valving flap pinned to said inner shoulder and itself slanting upwardly and inwardly toward the top side of the dust cup, the housing of the first unit being formed of two halves divided generally along a vertical plane extending along the length of the housing, said power switch means including a switch body and a sliding thumbpiece, said switch means being retained by interlocking engagement with said two halves of said housing when said halves are assembled together, said thumbpiece being in sliding overlying position relative to said latch means when the parts are assembled, said latch means being retained by interlocking engagement with said two halves of said housing and the underside of the latch means when the parts are assembled, pairs of posts extending transversely from the outer side walls of the two housing halves into mating and end-abutting relationship with each other, fastener means within the mating ends of each said pair to hold them in such relationship, the edges of the walls of said housing halves abutting at the region of said plane to close off the interior of the first unit, each housing half having interior stiffening ribs integrally formed with its walls and projecting beyond its said wall edges into supporting contact with the inside of a wall of the other housing half.

4,573,235

RUG CLEANING ATTACHMENT

Thomas E. Baird, Sr., Springfield, Ill., and John J. Jailor, N. Ridgeville, Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Oct. 26, 1984, Ser. No. 665,438
Int. Cl.[4] A47L *11/34*
U.S. Cl. 15—328 **6 Claims**



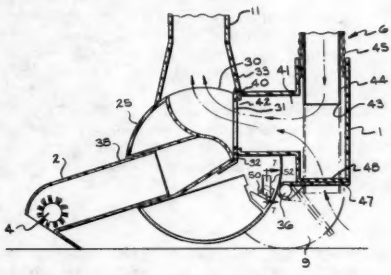
1. A rug cleaning device comprising: a power driven brush roll mounted for rotation in a forward-downward and rearward-upward direction around a horizontal axis, said brush roll comprising a cylinder having a multiplicity of radially extending bristle tufts which upon rotation define a cylindrical envelope, a suds confining and distributing chamber mounted ahead of said brush, said chamber including means for leveling and spreading suds confined therein so that an even layer of suds is laid on the rug ahead of the brush, means for generating suds and for delivering the generated suds to the suds confining and distributing chamber, a receptacle for dirty suds mounted ahead of said brush, doctoring means between said brush and said receptacle for removing from the brush the suds that it has picked up, said doctoring means comprising a blade projecting into and invading the cylindrical envelope defined by the path of travel of said tufts, said blade having a scalloped edge providing a multiplicity of cusp forming arches engaged by said tufts so that the adjacent bristles of each tuft are drawn together as they are forced along the intrados of each arch toward the point of maximum rise thereof to squeeze spent suds from the brush and so that the cusps comb filaments from said brush, whereby as said rug cleaning device is advanced, suds that had been laid down by said suds confining and distributing chamber are used by the brush to clean the rug, and each increment of suds that is picked up by the brush in the course of such cleaning is carried partially around the brush and removed by the doctoring means prior to completion of a single turn of the brush.

4,573,236

VACUUM CLEANING APPLIANCES

James Dyson, Bathford, England, assignor to Prototypes, Ltd., Bath, England

Continuation-in-part of Ser. No. 452,917, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 274,252, Jun. 16, 1981, abandoned. This application Jul. 2, 1984, Ser. No. 627,292
Claims priority, application United Kingdom, Jul. 8, 1983, 8318528
Int. Cl.[4] A47L *5/32*
U.S. Cl. 15—333 **17 Claims**



1. In a vacuum cleaning apparatus comprising a main casing having a dirt laden air conveying passageway leading thereto and containing a motor-driven fan unit, and including means for dirt retention in the apparatus, a hose section communicating with the passageway and providing an inlet for dirt laden air, a cleaning head as part of a floor engaging section of the apparatus mounted adjacent the main casing so as to be rotatably moveable relative to the casing to engage the floor and including a rotary brush unit in the casing, the cleaning head communicating separately in relation to the hose section with the air passageway, the improvement which comprises:

an air control valve means selectively positionable with the air passageway and mounted on the cleaning head for selectively directing dirt laden air into the main casing from either the cleaning head or the hose section through the air passageway depending upon the position of the valve; wherein, when the cleaning head is rotated to one first position relative to the main casing, the cleaning head is connected to the passageway in the casing by the air control valve means; and when the cleaning head is rotated to a second position, the cleaning head is discon-

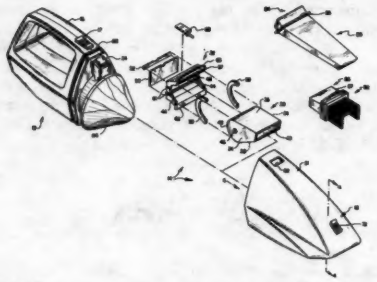
nected from the air passageway and the passageway is connected to the hose section by the air control valve means.

4,573,237

HAND VACUUM WITH TILTING INTAKE

Werner W. Kochte, Ravenna, and Susan K. Nimon, Cuyahoga Falls, both of Ohio, assignors to The Scott & Fetzer Company, Westlake, Ohio

Filed Apr. 10, 1984, Ser. No. 598,838
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—344 **22 Claims**



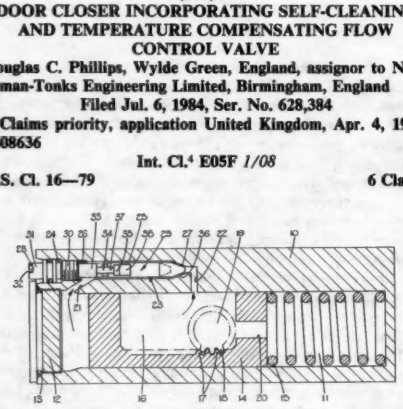
1. A hand held vacuum cleaner comprising a first unit including motor, fan and handle and a second unit projecting in front of the first unit and including a hollow dust-receiving cup having a cup mouth at its front end, a nozzle body projecting from the cup mouth and rotatably carried by means within the cup for rotation between different angular positions, said nozzle body substantially filling said cup mouth in all said angular positions, said nozzle body having side, top and bottom walls and defining a nozzle intake mouth at its forward end, said cup having a bottom wall which extends straightly in the forward direction and a top wall tapering toward said bottom wall in the forward direction and terminating forwardly of said bottom wall whereby said cup mouth leans forwardly, said nozzle mouth also leaning forwardly at a leaning angle similar to that of said forwardly leaning cup mouth when said nozzle body is at a position where a major portion of its bottom is parallel to the straight bottom of the dust cup.

4,573,238

DOOR CLOSER INCORPORATING SELF-CLEANING AND TEMPERATURE COMPENSATING FLOW CONTROL VALVE

Douglas C. Phillips, Wylde Green, England, assignor to Newman-Tonks Engineering Limited, Birmingham, England

Filed Jul. 6, 1984, Ser. No. 628,384
Claims priority, application United Kingdom, Apr. 4, 1984, 8408636
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—79 **6 Claims**



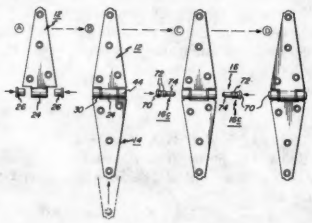
1. A door closer including a body, a chamber defined within said body, said chamber being intended to receive hydraulic fluid, in use, a piston slidably received within said chamber, a passage in said body through which said hydraulic fluid is intended to flow in both directions between opposite sides of at least part of the piston, a valve fitted in said passage to control the flow and comprising a first valve member and a second valve member, two abutment surfaces on the first valve member, means on the first valve member engaging it with the body and permitting the first valve member to be axially moved in the passage to a selected position, the second valve member being connected to the first valve member, one end of the second valve member being tapered, one end of the passage having a taper complementary to the taper of said one end of the second valve member, the second valve member being freely axially movable in the passage relative to the first valve member, solely by flow of fluid through the passage, between extreme positions where it engages said two abutment surfaces respectively, one of said extreme positions allowing unrestricted flow in one direction through said passage from said tapered end of the passage and the other extreme position allowing restricted flow in the opposite direction, at least one of the first and second valve members being made of plastics material having a greater coefficient of thermal expansion than the material of the body containing the passage in which the valve is fitted so that changes in the ambient temperature affect the clearance between the second valve member and the tapered end of the passage.

4,573,239

THREE KNUCKLE HINGE WITH BUSHING INSERTS IN CENTER KNUCKLE AND METHOD OF MAKING SAME

Richard L. Valenti, New Britain, and Daniel J. McCormick, Cheshire, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Aug. 17, 1984, Ser. No. 642,033
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—273 **10 Claims**



1. A three knuckle hinge comprising:

(a) a first leaf including an attachment portion and an elongated knuckle portion centrally located on one edge of said attachment portion, said knuckle portion being axially continuous and one-piece and having a passage extending axially therethrough;

(b) a pair of bearing inserts located at the opposite ends of said knuckle portion and extending into said axial passage, each of said inserts being one-piece and integrally formed with a tubular body portion of generally circular cross section and a radially outwardly extending flange portion at one end of said tubular body portion abutting the adjacent end of said knuckle portion, said tubular body portion having ribs on the outer surface therein deformed to provide frictional engagement with said knuckle portion to inhibit relative rotation, wherein the body portions of said bearing inserts have ribs on the inner surface thereof spaced along the inner walls

(c) a second leaf including an attachment portion and a pair of spaced apart knuckle portions along one edge of said attachment portion with said knuckle portion of said first leaf disposed therebetween and the adjacent surface of the

flange portions of said inserts directly abutting said knuckle portions of said second leaf, said knuckle portions of said second hinge leaf having an axially extending passage therein coaxial with said passage of said knuckle portion of said first leaf; and

(d) hinge pin means extending through said passages of said knuckle portions of said first and second leaves and in said inserts, said hinge pin means being engaged with said knuckle portions of said second leaf to prevent relative movement therebetween and being rotatable in said bearing inserts to provide a pivotal connection between said first and second leaves, said hinge pin means comprising two pin elements extending into said passages defined in said knuckle portions from opposite ends of said second leaf, said inner surface thereby providing the bearing surfaces for said hinge pin elements.

4,573,240

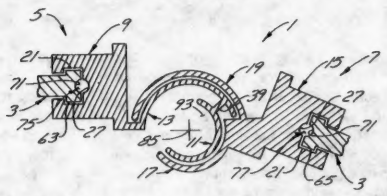
VERTICAL CLOSURE HINGE WITH AN ANTI-BINDING FEATURE

Henri M. R. Labelle, 50 Westmooreland Ave., Cornwall, Ont., Canada

Continuation of Ser. No. 331,385, Dec. 16, 1981, Pat. No. 4,475,268. This application Sep. 10, 1984, Ser. No. 648,502

Int. Cl.⁴ E05D *1/04*

U.S. Cl. 16—355 **2 Claims**



1. An assembly for rotatably joining together first and second panels about a vertical axis in a folding closure comprising: a vertical hinge having; a first elongated hinge member having two long sides, means on one of said long sides for connecting said first hinge member to said first panel, first and third curved hinge sections on the other of said long sides; a second elongated hinge member having two elongated sides, means on one of said second hinge member long sides for connecting said second hinge member to said second panel, second and fourth curved hinge sections on the other of said second hinge member long sides; said curved hinge sections on said first and second hinge members being interconnected to rotatably connect said hinge members together with the first hinge section lying within the second hinge section, the second section lying within the third hinge section, and the third hinge section lying within the fourth hinge section; a fastener having a head and a shank at at least the bottom end of said hinge for preventing longitudinal separation of said interconnected hinge members; said fastener being fastened by its said shank to the bottom end of the first curved hinge sections, the said head of the said fastener underlying the bottom end of the fourth hinge section, and spacer means completely encircling and carried by said fastener shank and located between said fastener head and the bottom ends of said curved hinge sections, the spacer means lying within the second hinge section for preventing said fastener head from contacting said bottom end of the second hinge section it underlies; and a link at said bottom end of said hinge for connecting said hinge members together, said fastener connecting said link to one of said hinge members by passing through an opening in one end of the said link, said spacer means positioned in the opening and having a thickness slightly greater than the thickness of said link.

4,573,241

HANGER LOOP ASSEMBLY

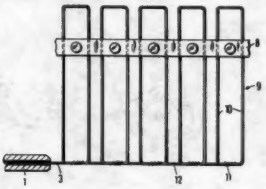
Herbert Niedecker, Am Ellerhang 8, 6240 Königstein, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 677,719

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343968

Int. Cl.⁴ A22C *11/00*

U.S. Cl. 17—44.2 **3 Claims**



1. An assembly of closed hanger loops provided on a carrying strap and adapted to be mechanically fed to machines for closing tubular films and bags, particularly sausages, characterized in that the loops (10) are connected on the carrying strap (8) by the thread (3) from which the loops have been formed and said thread (3) is a continuous thread, from which the loops (10) have been made in that the thread (3) overlaps itself in a portion (11) thereof and the overlapping thread portions (11) are joined to each other at least in part.

4,573,242

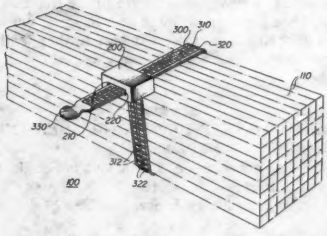
CLOSE PITCH HARNESSING DEVICE

Gordon B. Lankton, West Boylston, and Joseph R. Paradis, Holden, both of Mass., assignors to Nypro Inc., Clinton, Mass.

Filed Sep. 19, 1983, Ser. No. 533,353

Int. Cl.⁴ B65D *63/00*

U.S. Cl. 24—16 PB **12 Claims**



1. A harnessing device comprising

a head having a plurality of interconnected guide channels extending longitudinally therethrough;

a multi-section strap attached to said head with a separate section for each channel thereof;

a locking tang within said head, including a mid-section width which is thicker than opposed end portions, for each section of said strap; and

an anchor included in said head and being lockingly engaged by the free end of said tang when said strap is under load and said tang forms an arch extending from said anchor position to the root position where said tang is integral with said head.

4,573,243
SLIDING HOOK DEVICE FOR CLASPING PEARL OR GLASS BEAD NECKLACES THAT HAVE A FREE HANGING END

Jaime P. Plaza, Barcelona, Spain, assignor to Majorica, S.A., Barcelona, Spain

Filed May 25, 1984, Ser. No. 614,731
Claims priority, application Spain, Dec. 28, 1983, 276.594
Int. Cl.[4] F16G *15/00*
U.S. Cl. 24—116 A **7 Claims**

1. A sliding hook for clasping jewelry necklaces that have both a free and a fixed end and include a plurality of pearls or similar individual members, comprising:

a body having a rear side provided with emerging lugs;

a ring of a substantially open turn shape disposed on said rear side of said body so as to allow for slightly oblique passing of the free end of the necklace;

a joining point disposed on said rear side of said body for affixing the fixed end of the necklace; and

an articulated annular blade having legs provided with points and being disposed on said rear side of said body, said blade having a shape corresponding to that of said pearls or similar individual members, said emerging lugs of said rear side of said body cooperating with said points of said legs of said annular blade so as to provide said legs with spring action, said blade being movable relative to said ring between an unclamped position in which a part of the necklace can be passed between said ring and said blade, and a clamped position in which the spring action of said legs applies toward said ring and retains between said ring and said annular blade the pearl or similar individual member at an end of the part of the necklace so as to selectively determine the length of the free end of the necklace being passed through and hanging out of said ring, said spring action of said legs further tending to maintain said annular blade in said clamped position.

4,573,244
COMBINATION CONDIMENT GRINDER AND DISPENSER

David A. Holcomb, and James A. Tryon, both of Seattle, Wash., assignors to F. Bartow Fite, Seattle, Wash.

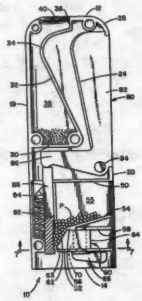
Filed May 29, 1985, Ser. No. 738,827
Int. Cl.[4] A47J *42/34*
U.S. Cl. 241—169 **20 Claims**

1. A combination condiment grinder and dispenser device, comprising:

(a) a housing adapted to be held and operated by one hand of the user, said housing having a top end and a bottom end on which said housing is supported and including generally in the upper portion thereof a lever recess portion defining a reduced housing area in said upper portion for being conveniently gripped by the user's hand, said recess portion including a lever opening therein for receiving an operating lever,

(b) an operating lever disposed in said lever recess portion such that said operating lever has an outward first nonoperating position and an inward second operating position in which said operating lever is moved by squeezing action of the user's hand into said lever opening within said reduced housing area,

(c) a first condiment compartment located in the lower portion of said housing generally below said upper recess portion for containing condiment to be ground and including an adjustable grinding block means with a shearing surface thereon, and further including a generally reciprocally moving slide member having grinding serrations thereon which coact with said grinding block for comminuting said condiment, said reciprocally moving slide member including a means for biasing the slide member to a rest position, said grinding block means and said slide



member having a grind opening therebetween through which ground condiment is dispensed from said housing,

(d) actuating lever means connected to said operating lever and included within said housing and extending from said operating lever below said lever recess portion and above said lower portion which contains said condiment compartment and into contact with said slide member for forcing said reciprocally moving slide member into operative movement when said operating lever is squeezed by said user's hand, and

(e) adjustment means for said grinding block which provides movement of said block for adjusting the grinding action from fine to coarse.

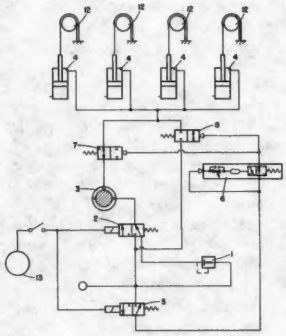
4,573,245
BRAKING SYSTEM FOR YARN BEAMING ASSEMBLIES

Jörg Pfister, and Arnold Kuzmenko, both of Freiburg, Fed. Rep. of Germany, assignors to Rhodia AG, Freiburg, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,864
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224507
Int. Cl.[4] D02H *13/08, 13/26*
U.S. Cl. 28—187 **3 Claims**

3. An apparatus for assembling warps of spun fibers and/or filament yarns present on yarn beams to form a textile warp present on a warp beam, said apparatus having sensing means for responding to a sensed condition of the warp or components thereof and first control means for controlling the braking of said yarn beams upon occurrence of a sensed condition of the warp or components thereof, said first control means including a pneumatic pressure regulator (1), for providing compressed air at higher pressure, an electromagnetically operable first pneumatic valve (2) downstream of said pressure regulator, a three-position rotary disk valve (3) downstream of said pneumatic valve, and pneumatically operable yarn beam brake cylinders (4) downstream of said three-position rotary disk valve and connected in parallel, said rotary disk valve having an inlet side connected to said pneumatic valve and being sometimes temporarily closed at its inlet side whereby compressed air at higher pressure from said pneumatic pressure regulator reaches said brake cylinders of said yarn beams

with a delay, the improvement which comprises second control means having bypass means connected to said first control means and to said yarn beam brake cylinders for bridging the switching time of said rotary disk valve of said first control means thereby preventing asynchronous pneumatic braking of said yarn beams relative to said warp beam by avoiding delay in braking of said yarn beams caused by said rotary disk valve being closed at its inlet side, upon occurrence of a sensed condition of the warp or components thereof and the ensuring rapid braking, said second control means comprising a second pneumatic valve (7,10) arranged downstream of said three-



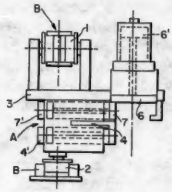
position rotary disk valve (3) and upstream of said brake cylinders (4), a third pneumatic valve (8,11) connected in parallel with said second pneumatic valve (7,10) and upstream of said brake cylinders (4), and a delay element (6,9) connected upstream of said second and third pneumatic valves; actuation of said second pneumatic valve cutting off the fluid flow between the rotary disc valve (3) and the brake cylinders (4) and actuation of said third pneumatic valve permitting air pressure to effect braking of the yarn beams, the flow to said second and third pneumatic valves at the end of the delay period being switched off as the rotary disc valve (3) reaches the open position.

4,573,246

PINCERS FOR THE EXTRACTION OF METAL RODS FROM BUNDLES

Marcello Del Fabro, Udine, and Giorgio Del Fabro, Montegnacco, both of Italy, assignors to SAE-Societa Automatismi Elettonici s.r.l., Tavagnacco, Italy

Filed May 16, 1984, Ser. No. 536,981
Claims priority, application Italy, Sep. 27, 1982, 83451 A/82
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—252 **3 Claims**



1. Pincers for the extraction of metal rods from bundles, of the type that can be moved in a longitudinal direction to grip one or more rods and extract and/or feed the latter by drawing them along in a longitudinal direction, and comprising a supporting frame having a fixed flange disposed laterally thereof;

a flat support base having one side upon which the individual rods making up the bundle rest flat and movable relative to said supporting frame from a retracted position to an overhanging position adjacent said flange, hydraulic means on said supporting frame, for moving said flat support base between its retracted and overhanging positions;

a flat guide cheek opposing the flat support base and movable against the latter so as to be brought close to the row of rods lying on said flat support base without gripping them but sufficiently close to hold them in a position in which they are lying in the same plane;

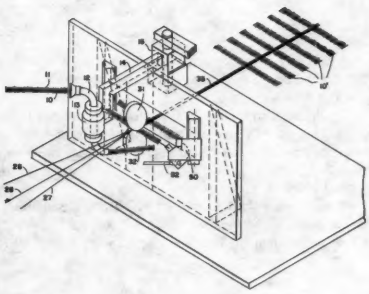
a side clamp movable transversely in relation to the longitudinal direction of the rods and in the plane in which the rods are lying so as to move from an open position to a position in which said rods are gripped against the said fixed flange, said side clamp sliding in the free space between said flat support base and said opposite guide cheek so as to firmly grip the rods there enclosed pushing one against the other and against said flange.

4,573,247

ARTIFICIAL TREE LIMB MAKER MACHINE

Enrico Spinelli, Larciano, Italy, assignor to Mr. Christmas Incorporated, New York, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,382
Int. Cl.⁴ B23D *17/00;* D02G *3/42;* B21F *7/00*
U.S. Cl. 29—417 **11 Claims**



8. A method of making an artificial tree limb comprising the steps of

feeding twisted wires with simulated needles therein to a pair of spaced cutters by a reciprocating motion transverse to the machine,

feeding wires and decorative material to a pair of pulleys,

cutting the twisted wires with simulated needles to lengths determined by the distance between said spaced cutters,

twisting said wires and decorative material and catching said lengths of wires with simulated needles therein in a position substantially perpendicular to said wires with decorative material.

4,573,248

METHOD AND MEANS FOR IN SITU REPAIR OF HEAT EXCHANGER TUBES IN NUCLEAR INSTALLATIONS OR THE LIKE

Steven B. Hackett, 17822 Arbor La., Irvine, Calif. 92715

Filed Jun. 4, 1981, Ser. No. 270,574
Int. Cl.⁴ B23P *17/00, 11/02, 15/26*
U.S. Cl. 29—423 **5 Claims**

1. A method of sealing leaky heat exchanger tubes in situ in nuclear installations, comprising the steps of:

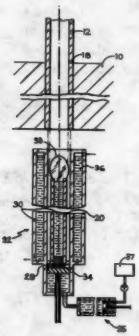
(a) providing a sleeve having an outer diameter slightly larger than the inner diameter of the tube whose leak is to be sealed and having a length shorter than the length of said tube yet sufficient to overlap said leak and having a

flange at one end thereof, said flange being dimensioned larger than the inner diameter of said tube for limiting insertion of said sleeve into the tube;

(b) cooling said sleeve to a temperature at which its outer diameter is sufficiently reduced to allow insertion of said sleeve into said tube;

(c) inserting said cooled sleeve into said tube to be sealed through one end of the tube to overlap said leaky portion while said sleeve is so cooled until said insertion is limited by said flange;

(d) allowing said sleeve to warm up to the temperature of said tube,



(e) said sleeve being open at both ends such that fluids flowing through said heat exchanger tube flow through said sleeve also; and

(f) guiding said sleeve into position for insertion by means of a guide fabricated of material which is solid at insertion temperatures but becomes fluid at room temperature, and allowing said guide to become fluid when the insertion of said sleeve is complete,

whereby said sleeve forms with the inside of said tube in the region of said leak a leak-proof sealing bond with a generally uniform hoop stress thereby repairing said leak.

4,573,249

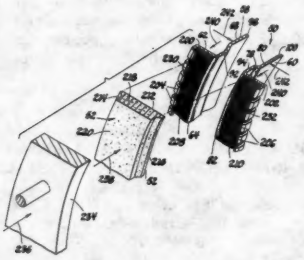
METHOD OF MANUFACTURING BRAKE SHOE ASSEMBLY

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 539,107, Oct. 5, 1983. This application Nov. 19, 1984, Ser. No. 672,667

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—432 **4 Claims**



1. A method of making a brake shoe and lining assembly comprising the step of:

(a) providing a formed lining segment having opposite edges;

(b) providing a pair of brake shoe sections, each having a rim portion and a web portion, serrations transversely formed on the rim portion surface which is to be supportive of the lining segment, and reversely bent tab means on the outer edge of the rim portion;

(c) mounting the pair of brake shoe sections in laterally spaced and aligned relation;

(d) placing the lining segment on the laterally spaced supportive rim portion surfaces so that the lining segment is engaged with the rim portion transverse serrations only adjacent the lining segment edges;

(e) forcing the lining segment into the rim portion surfaces to initiate formation of transversely extending complementary mating serrations in the surface of the lining segment engaging the rim portion, and holding the lining segment in place;

(f) moving the shoe sections laterally together, causing the rim portion serrations to form the transversely extending complementary mating serrations through the lining segment surface engaging the rim portions and further causing the lining segment edges to be engaged by the tab means on the outer edges of the rim portions in holding and retaining relation; and

(g) securing the shoe sections together in the web portions to form the brake shoe and hold the lining segment in position thereon by the tab means and the mating serrations.

4,573,250

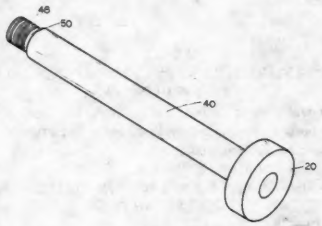
METHOD OF REPAIRING A PISTON SHAFT ASSEMBLY OF A RAILWAY CAR END-OF-CAR CUSHIONING UNIT

Dennis Miller, 6267 Curtis Ave., Omaha, Nebr. 68104, and Scott R. Koch, 6803 Minne Lusa Blvd., Omaha, Nebr. 68112

Filed Oct. 13, 1983, Ser. No. 541,711

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—447 **11 Claims**



1. A method of repairing a piston shaft assembly of a railway car cushioning unit, said piston shaft assembly including a piston fixedly mounted on a piston shaft, comprising,

providing an elongated bar stock for a new shaft,

sawing said bar stock to length for a new shaft,

finishing an end portion of said new shaft to a first diameter,

providing a piston shaft assembly for a railway car cushioning unit,

sawing said piston shaft adjacent the piston, thereby to separate said piston from said piston shaft,

axially boring said piston to provide a bore of a diameter slightly less than said first diameter,

heating said piston to a temperature sufficient to expand the bore diameter to at least said first diameter,

placing the heated piston onto said end portion of said new shaft, and

cooling said piston whereby said piston is shrink-fit onto said new piston shaft end portion.

4,573,251
APPLYING AN ELASTIC SLEEVE OVER AN ELONGATE BODY

Colin D. Hillyard, Southampton, England, assignor to Pirelli General plc, London, England

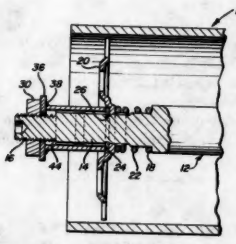
Filed Feb. 5, 1985, Ser. No. 698,311
Claims priority, application United Kingdom, Feb. 24, 1984, 8404869; Jul. 12, 1984, 8417786
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 9 Claims

1. A method of applying a tubular sleeve of elastic material over an elongate body which has a diameter or cross-sectional size greater than the inner diameter of the sleeve, comprising turning each end portion of the sleeve back on itself, engaging one turned back end portion of the sleeve over an end portion of the elongate body to form a partial fluid-tight seal between said turned back sleeve end portion and said elongate body, temporarily closing the opposite end of the sleeve and introducing fluid under pressure to the interior of the sleeve through a relatively flat valve in its side wall to inflate the sleeve sufficiently to enable it to be floated along the elongate body, displacing the sleeve along the elongate body such that the other turned back end portion engages over said end portion of the elongate body to form a partial fluid tight seal between said other turned back sleeve end portion and said elongate body, and thereafter floating said sleeve along said elongate body to a desired position thereon.

4,573,252
METHOD OF INSTALLING STEERING WHEEL LOCK PLATE ON A STEERING WHEEL SHAFT

Robert W. Shay, 501 SW. 2nd St., Hallandale, Fla. 33009

Filed Nov. 19, 1984, Ser. No. 673,050
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—453 2 Claims

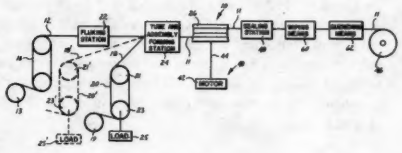


1. The method of installing a steering wheel lock plate on a steering wheel shaft of the type including: (1) a splined upper end portion spaced above an upwardly facing annular shoulder on said shaft, (2) a circumferential groove formed in said splined upper end portion, (3) a cylindrical coiled compression spring disposed on said shaft above and downwardly abutted against said shoulder and extending upwardly along said shaft in a static condition to a point spaced above said groove, (4) an internally splined steering wheel locking plate slidingly disposed and meshed with said splines on said upper end portion above said spring and downwardly abutted thereagainst, (5) a snap ring disposed on said upper end portion above said plate and downwardly abutted against the inner periphery thereof, and (6) a diametrically reduced externally threaded upper terminal end, said method comprising the step of telescoping an open ended sleeve downwardly over and along said splined upper end portion with said sleeve having an inside diameter less than the outside diameter of said ring and being downwardly abutted against said ring, and downwardly displacing said sleeve further along said upper end portion so as to downwardly displace said lock ring and plate along said upper end portion while compressing said spring against said shoulder to a position with said lock ring registered with and snapped into said groove.

4,573,253
OPTICAL FIBER CABLE FABRICATION TECHNIQUE

Warren F. Smith, Branford; Eugene Shapiro, Hamden, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 29, 1984, Ser. No. 626,509
Int. Cl.[4] B23P *19/04;* G02B *6/44*
U.S. Cl. 29—460 21 Claims



1. A process for fabricating an optical fiber cable assembly, said process comprising:

applying a pull force to a metal or metal alloy tape and pulling said tape through means for forming said tape into a hollow armor tube having a desired outer diameter and a desired inner diameter; and

inserting at least one optical fiber into said forming tube, said inserting step including applying a back tension force to said at least one optical fiber, said back tension force having a magnitude substantially equal to that defined by the following equation:

$$P_F = E_F\left[\frac{P_T}{\frac{\pi}{4}(D_{OD}^2 - D_{ID}^2)E_A}\right]\left(\frac{\pi D_F^2}{4}\right)$$

where

P_F=a desired back tension force magnitude;
E_F=elastic modulus of said at least one optical fiber;
P_T=said pull force;
D_{OD}=said desired outer tube diameter;
D_{ID}=said desired inner tube diameter;
E_A=elastic modulus of said metal or metal alloy; and
D_F=outer diameter of each said optical fiber.

4,573,254
APPARATUS FOR MAINTAINING ELECTRONIC COMPONENT PIN ALIGNMENT

Kenneth H. Kirk, Harleysville, and Robert R. Tarbuck, Ardmore, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,121
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—564.8 11 Claims

1. An apparatus for maintaining electronic component pin alignment comprising:

a support member;

a lead shear mounted adjacent said support member;

a stationary nest mounted adjacent said support member;

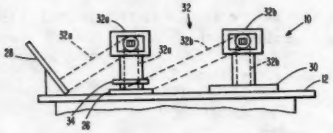
a printed circuit board mounted adjacent said support member;

a component feeder mounted adjacent said support member;

a component in said component feeder, said component being a chip including a plurality of leads having a first

end connected to said chip and a second free end, and having a movable lead guide engaging said first end of said leads; and

robotic means mounted adjacent said support member for picking up said component from said component feeder, inserting said component in said stationary nest, moving said component relative to said stationary nest for moving



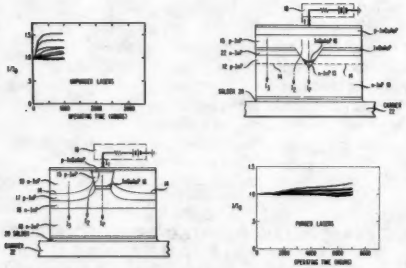
said lead guide from said first end of said leads toward said second free end of said leads, moving said component from said stationary nest to said shear for shearing said second free end of said leads, and moving said component from said shear to said printed circuit board and urging said leads into corresponding holes formed in said printed circuit board.

4,573,255

PURGING: A RELIABILITY ASSURANCE TECHNIQUE FOR SEMICONDUCTOR LASERS UTILIZING A PURGING PROCESS

Eugene I. Gordon, Convent Station; Robert L. Hartman, Warren, and Franklin R. Nash, Princeton, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 22, 1984, Ser. No. 592,285
Int. Cl.[4] H01L *21/66*
U.S. Cl. 29—574 **17 Claims**



1. A method of manufacturing semiconductor lasers, which includes screening lasers relative to predetermined performance criteria, comprising the steps of:

(a) subjecting each of said lasers to a first temperature T_1,

(b) applying terminal current I_1 to each of said lasers such that the combination of said current I_1 and temperature T_1 is sufficiently high that said lasers emit virtually no stimulated emission,

(c) continuing steps (a) and (b) concurrently for a time period t_1,

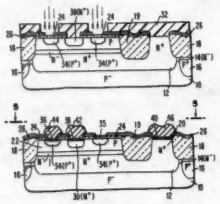
(d) measuring an electrical and/or optical characteristic of said lasers so as to separate those which meet predetermined performance criteria from those which do not.

4,573,256

METHOD FOR MAKING A HIGH PERFORMANCE TRANSISTOR INTEGRATED CIRCUIT

John S. Lechaton, Wappingers Falls, N.Y.; Philip M. Pitner, Palo Alto, Calif., and Gurumakonda R. Srinivasan, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1983, Ser. No. 526,849
Int. Cl.[4] H01L *21/265, 21/203, 27/02*
U.S. Cl. 29—576 B **12 Claims**



1. A method for making a high performance NPN bipolar transistor functioning in a current switch logic circuit comprising:

forming a bipolar transistor within an isolated region of a monocrystalline silicon body wherein said transistor includes an N+ subcollector, a N collector reach-through which connects said subcollector to a major surface of said body, a P base region above said subcollector and adjacent to said reach-through, an N+ emitter region within said base region and extending from said major surface, and wherein said base region includes an intrinsic base region located below said emitter region and an extrinsic base region located extending from said major surface and adjacent to said emitter region;

forming a mask above said major surface which has openings therein only in the areas above major portions of said extrinsic base regions;

forming a P+ region in said extrinsic base region by ion implanting with a P type dopant and to a depth of less than the depth of said N emitter region;

annealing the structure to activate the P type dopant in the P+ region; and

making electrical ohmic contact to the elements of said transistor and connecting them in said current switch logic circuit.

4,573,257

METHOD OF FORMING SELF-ALIGNED IMPLANTED CHANNEL-STOP AND BURIED LAYER UTILIZING NON-SINGLE CRYSTAL ALIGNMENT KEY

Terry S. Hulseweh, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 14, 1984, Ser. No. 650,931
Int. Cl.[4] H01L *21/20, 21/74, 21/76*
U.S. Cl. 29—576 E **20 Claims**

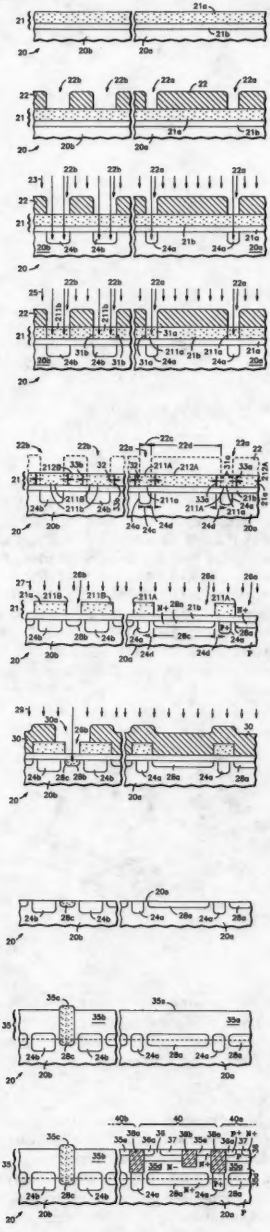
1. A method for fabricating self-aligned buried doped regions in a semiconductor device, comprising:

providing a semiconductor substrate having a device portion and an alignment key portion;

covering a surface of said substrate with a first masking layer having a modifiable etch rate;

covering said first layer with a second masking layer having first open portions exposing first portions of said first masking layer above first regions of said device portion of said substrate, and second open portions exposing second portions of said first masking layer located above first regions of said alignment key portion of said substrate;

doping said first regions of said device portion of said substrate through said exposed first portions of said first masking layer;



modifying said etch rate of said first and second portions of said first masking layer exposed in said first and second open portions of said second masking layer;

creating holes in said first masking layer by removing those portions of said first masking layer whose etch rate has not been modified in the preceding steps, said holes in said first masking layer lying above second regions of said device portion and a key region of said alignment key portion of said substrate;

doping said second regions of said device portion of said substrate through said holes in said first masking layer;

rendering said key region of said alignment key portion of said substrate non-single crystal;

exposing said surface of said substrate;

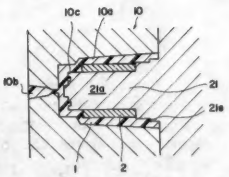
forming a semiconductor layer on said surface of said substrate which is non-single crystal above said non-single crystal key region of said substrate and single crystal adjacent said non-single crystal key region and above said first and second regions of said device portion of said substrate.

4,573,258

METHOD OF MANUFACTURING MOTOR

Shinichi Io, Hatano, and Funio Saeki, Atsugi, both of Japan, assignors to Atsugi Motor Parts Co., Ltd., Kanagawa, Japan

Filed Jan. 9, 1985, Ser. No. 689,996
Claims priority, application Japan, Jan. 18, 1984, 59-6724
Int. Cl.[4] H02K *15/02;* **B28B** *7/22*
U.S. Cl. 29—596 **6 Claims**



1. A method of manufacturing a motor body including a motor magnet, which comprises the following steps of:

(a) injecting a magnetic material into a space formed between a magnet forming mold and a magnet molding core in accordance with an injection molding method, while applying a magnetizing force to the injected magnetic material, to mold a motor magnet;

(b) extracting the molded magnetized magnet together with the magnet molding core from the magnet forming mold;

(c) injecting a resin material into a space formed between a motor body forming mold and the magnet molding core having the molded and magnetized magnet in accordance with an injection molding method to mold a motor body including the motor magnet (2);

(d) extracting the molded motor body including the molded and magnetized magnet together with the magnet molding core from the motor body forming mold; and

(e) extracting the magnet molding core from the extracted motor body including the magnetized motor magnet.

4,573,259

METHOD OF MAKING AN AUTOMATED Q-LINE CIRCUIT BREAKER

Raymond K. Seymour, Plainville; Joseph M. Palmieri, Southington; William J. Ashline, Bristol, and Dennis J. Doughty, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 561,259, Dec. 14, 1983, Pat. No. 4,513,268.
This application Dec. 5, 1984, Ser. No. 678,208
Int. Cl.[4] H01H *11/00*
U.S. Cl. 29—602 R **1 Claim**

1. A method for automatically assembling a circuit breaker assembly within a molded plastic circuit breaker case having a plurality of retaining slots and guide channels integrally formed within the case comprising the steps of:

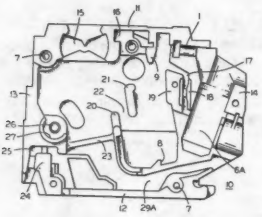
inserting an armature containing a latch opening within a first one of said retaining slots within said case;

positioning a contact blade and trip unit assembly over said armature within said case;

inserting a magnetic core over said trip unit and said armature and positioning a hook extension on said magnetic core over a shelf portion on said armature;

positioning a handle member within a second one of said retaining slots within said case;

inserting a two legged U-shaped cradle member having a circular end member at an end of one of the legs and a latch portion at an end of the other of the legs and positioning the circular end member over a pivot formed within said case and positioning said latch portion in operative relation to said armature latch opening;



arranging a mechanism spring, having a closed loop eye at both ends, between said cradle and said contact blade by engaging one of said spring eyes over a spring tab on said contact blade and engaging the other of said spring eyes over a spring tab on said cradle;

inserting a latch spring within a third one of said retaining slots within said case proximate a top end of said armature;

positioning an arc chute and fixed contact within a fourth recess formed in said case in operational relationship with said contact blade; and

fastening a molded plastic cover having a corresponding plurality of slots formed therein over said case whereby said slots formed in said cover cooperate with said slots formed in said case to provide operational clearance for said circuit breaker assembly.

4,573,260

INDUCTION HEATED INTERCELL FUSION FOR LEAD/ACID STORAGE BATTERY

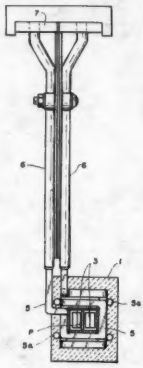
William E. Mullane, Warren, Ohio, and David Lund, Minneapolis, Minn., assignors to The Taylor-Winfield Corporation, Warren, Ohio

Filed Jun. 28, 1985, Ser. No. 749,629

Int. Cl.[4] H01M *6/00*

U.S. Cl. 29—623.1 **9 Claims**

1. A method of making an intercell connection in a storage battery with "over-the-partion" type riser construction, having vertical partition walls, comprising suspending a mold on the top of a partition wall with half of the mold on each side of said wall, projecting a pair of lead risers of intercell elements through said mold, one on each side of said mold, surrounding said mold and the upper end portion of said partition wall and the upper end portions of said lead risers with a coil, energizing said coil with sufficiently high frequency alternating electric current as to induction heat and melt the tops of said upper end portions of said lead risers to the top of said partition so as to bridge said lead risers over said partition and make an intercell connection, cooling said melted portions to solidification, and



finally separating said coil and mold from said risers and partition wall.

4,573,261

AUTOMATIC ASSEMBLING MACHINE

Yasuhiro Honda; Katumi Ueno; Genichi Nishizaki; Harumi Kitahara, and Hiroshi Kamioka, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

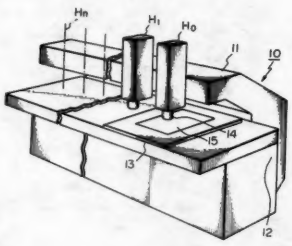
Division of Ser. No. 333,496, Dec. 22, 1981, Pat. No. 4,503,606.

This application Oct. 2, 1984, Ser. No. 657,106

Claims priority, application Japan, Dec. 26, 1980, 55-184078; Dec. 29, 1980, 55-186851; Dec. 29, 1980, 55-189330[U]; Dec. 29, 1980, 55-189331[U]; Jan. 27, 1981, 56-10445

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—701 **1 Claim**



1. An automatic printed circuit board assembly machine in which a plurality of electronic parts are assembled on a printed circuit board at a plurality of predetermined assembling positions thereof, comprising:

a base;

a frame secured to said base;

assembling heads mounted on said frame;

a movable table provided on said base and carrying thereon said printed circuit board, said table being movable in an operating area to a selected one of a plurality of predetermined assembling head position coordinates, respectively, in dependence on the kinds of electronic parts to be assembled on said circuit board such that an origin of said printed circuit board is positioned at said selected one of said plurality of predetermined assembling head position coordinates to align said plurality of predetermined assembling positions to another plurality of predetermined assembling positions determined by said selected one of said

plurality of predetermined assembling head position coordinates;

assembling position coordinates memory means for storing assembling position coordinates corresponding to said plurality of predetermined assembling positions, respectively, of said printed circuit board;

head position coordinates memory means for storing said predetermined assembling head position coordinates;

head selection command memory means for storing data of which one of said assembling heads is to be selected;

head selection command selector means for selecting said one of said assembling heads in response to an output signal from said head selection command memory means;

an arithmetic unit responsive to output signals from said assembling position coordinates memory means and said head position coordinates memory means for producing an output data in dependence on said assembling position coordinates and said selected one of said predetermined assembling head position coordinates; and

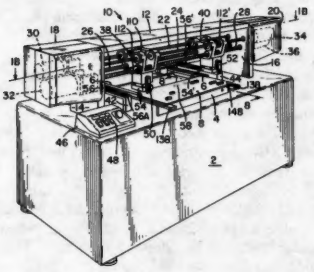
means for operating said movable table in response to the output data of said arithmetic unit.

4,573,262

APPARATUS FOR FORCE FITTING COMPONENTS INTO A WORKPIECE

Bryan J. Dornes, Hershey; Edward J. Paukovits, Jr., Hummelstown; Richard V. Spong, Etters, and Robert J. Talarico, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 11, 1984, Ser. No. 609,387
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—739 **13 Claims**



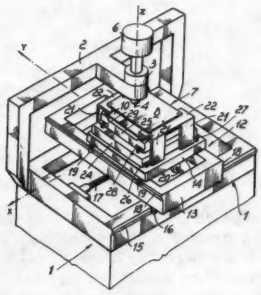
1. Apparatus for force fitting components into a workpiece, comprising means for supporting the workpiece in a given plane, first and second insertion heads, means for supporting the insertion heads for translatory movement along a predetermined path parallel to the given plane and on one side thereof, first drive means for intermittently translating the insertion heads along said path, component pick-up and insertion means moveably mounted on each insertion head, second drive means for moving the pick-up and insertion means towards and away from the given plane, a first component pick-up station on the one side of the workpiece supporting means and at one end of the predetermined path, and being associated with the first insertion head, a second component pick-up station on the opposite side of the workpiece supporting means and at the other end of the predetermined path, and being associated with the second insertion head, means for moving the workpiece at right angles to said predetermined path and in said plane, and control means for cyclically operating said drive means, so that each insertion head in turn is translated to a first position opposite to its associated component pick-up station and its component pick-up and insertion means is moved towards and away from such pick-up station to pick-up a component therefrom, and the insertion head is then translated to a second position opposite to the workpiece when such is supported by the workpiece supporting means and the component pick-up and insertion means of the insertion head is moved towards the workpiece to force fit the picked-up component thereinto, in which apparatus the drive means are so controlled that whilst one insertion head is in its first position the other insertion head is in its second position.

4,573,263

AUTOMATIC CONTACT-PIN SETTING APPARATUS FOR TESTING AN "OFF-GRID" PRINTED CIRCUIT

Ivo De Rossi, Via Carducci, 3, Arbizzano Di Negrar (Province of Verona), Italy

Filed Oct. 3, 1984, Ser. No. 657,426
Claims priority, application Italy, Oct. 7, 1983, 84964 A/83
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—741 **5 Claims**



1. An automatic contact-pin setting apparatus for testing an off-grid printed circuit, the apparatus having a contact-pin feeding head, a scanning unit, and an adaptor including a bed of plugs which are accommodated in respective holes formed in a basic plate according to a standard grid configuration and electrically connected to the circuit scanning unit, a reference plate which has a plurality of through holes arranged in the same "off-grid" configuration as the "off-grid" printed circuit to be tested and is located facing the basic plate, characterized in that the said adaptor comprises a first frame bearing the said basic plate and a second frame supporting the said reference plate movably mounted one with respect to the other so as to shift the said basic and reference plates one with respect to the other and to the said contact-pin feeding head across parallel planes spaced from one another, drive means for actuating the said first and second frames, and a processing unit arranged to control the said contact-pin feeding head and the said drive means to sequentially move holes in the reference plate to an operative position with respect to the said contact-pin feeding head and to shift the plug hole nearest to it in the basic plate in alignment with it to receive a contact-pin from the said contact-pin feeding head.

4,573,264

METHOD AND APPARATUS FOR FEEDING SLIDERS TO SLIDER POCKET FOR ASSEMBLING SLIDERS ON AN UNCUT FASTENER CHAIN

Shingo Hatagishi, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 430,960, Sep. 30, 1982, Pat. No. 4,466,168.
This application May 25, 1984, Ser. No. 614,383
Claims priority, application Japan, Dec. 28, 1981, 56-214947
Int. Cl.[4] B21D *53/50*; A41H *37/06*
U.S. Cl. 29—766 **1 Claim**

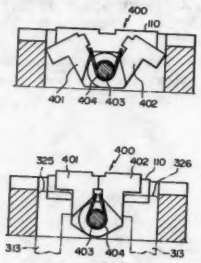
1. An uncut fastener chain converging mechanism characterized by comprising:

a support shaft implanted in the end face of a support block

for uncut fastener chain transfer directly below an element guide channel of said support block;

a pair of L-shaped pieces the ends of the longer legs whereof are loosely fitted on said support shaft, the shorter legs whereof are directed away from each other; and

a coil spring wound around said support shaft, an elastic force due to straight end portions of the coil spring acting in a direction to urge said pair of L-shaped pieces away from each other;



opposing corner portions of each of the shorter legs of said pair of L-shaped pieces being provided with L-shaped cut-outs;

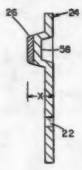
the opposing side faces of each of the longer legs being brought into mutual contact owing to the outer side faces of each of the longer legs of said pair of L-shaped pieces being engaged by the upper end faces of a holder case when the holder case is raised, a fastening element section of the uncut fastener chain being clamped by said cut-outs of the opposing corner portions of each of the shorter legs of the L-shaped pieces.

4,573,265

METHOD OF MAKING ELECTRICAL CONTACTS

Donald E. Conaway, Jr., Attleboro, and Ernest M. Jost, Plainville, both of Mass., assignors to Checon Corporation, Attleboro, Mass.

Filed Mar. 19, 1984, Ser. No. 590,631
Int. Cl.[4] H01R *43/02*
U.S. Cl. 29—879 **6 Claims**



1. The method of making an electrical contact which comprises providing a clad strip comprising a base metal contact blade in continuous strip form having bonded thereto a layer of contact material in continuous strip form coextensive in length with said base metal strip and spaced inwardly from the longitudinal margins thereof,

removing said contact material from said clad strip at spaced intervals along said strip, and

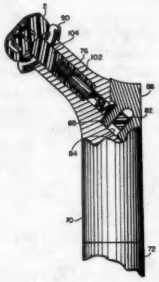
severing said base metal strip in said intervals to form individual contacts each having lateral margins in addition to said longitudinal margins and having an element of contact material bonded to said base metal and spaced inwardly from all of the margins thereof.

4,573,266

RAZOR BLADE ASSEMBLY

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 419,202, Sep. 17, 1982, Pat. No. 4,492,024. This application Oct. 15, 1984, Ser. No. 660,953
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] B26B *21/22, 21/44*
U.S. Cl. 30—41 **3 Claims**



1. A razor blade assembly comprising a leading blade member having a first cutting edge and a following blade member having a second cutting edge, said cutting edges being parallel with each other and facing a same direction to act in tandem upon a surface being shaved, said leading and following blade members being disposed between guard and cap portions adapted in operation to engage said surface being shaved ahead of and behind, respectively, said first and second cutting edges, said leading and following blade members and said guard portion being movable independently of the remainder of said blade assembly and independently of each other in response to forces encountered during a shaving operation, a shaving aid fixed to one of said guard and cap portions, said shaving aid being formed of a hydrophobic material and a water leachable hydrophilic polymeric material, the blade assembly having pivot mounting means thereon for pivotal attachment to a razor handle assembly, the blade assembly, as a whole, being pivotally movable on said handle assembly in response to forces encountered during the shaving operation, and a cam means on said assembly adapted to receive a biasing means disposed in said handle assembly and adapted to exert a yieldable biasing force on said pivotally movable blade assembly, whereby to maintain maximum contact between said surface being shaved and said leading and following independently movable blades, said independently movable guard portion, and said shaving aid.

4,573,267

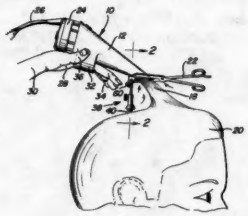
HAIRCUTTING DEVICE

Jane L. Grohoski, P.O. Box 325, Swamp Picnic Rd., and Diane L. Marinari, 458 Kleman Rd., both of Gilbertsville, Pa. 19525

Filed Mar. 15, 1984, Ser. No. 590,024
Int. Cl.[4] B26B *19/44*
U.S. Cl. 30—133 **8 Claims**

1. A haircutting device comprising an elongated hollow vacuum nozzle having an intake at one end thereof and means at the other end for reducing the pressure inside of the nozzle so that hair on a person's head will be drawn into the intake of the nozzle with the intake end of the nozzle forming a guide by which the hair can be cut by using a cutting implement, means on said nozzle for supporting engagement with a hand of the person using the device to enable the device to be manipulated in relation to the hair of a person receiving a haircut, and means adjustably supporting the intake end of the nozzle from

the surface of the head in order to accurately position the intake end of the nozzle in spaced relation to the head, said supporting means including a ball rollingly engaging the surface of the head for movement of the nozzle in any direction while the intake end is supported in predetermined relation to the surface of the head, said means supporting the intake end of the nozzle including a depending boss on the nozzle, a right angular support rod having a horizontal portion extending through the boss and a depending vertical portion, a lock



screw threaded into the boss for locking the support rod in adjusted position slidably and rotatably therein, a socket receiving said ball rotatably in the lower end thereof and including a tubular stem telescopically receiving the vertical portion of the support rod, and a lock screw threaded into the stem and locking the stem adjustably on the rod, and a graduated scale on the vertical portion of the support rod with the scale being associated with the top edge of the stem to indicate the height of the intake of the nozzle from the surface of the head.

4,573,268

FOLDING FILLET KNIFE WITH BLADE LATCHING MEANS

Daniel D. Call, Athens, Wis., assignor to Oy Fiskars AB, Helsinki, Finland

Continuation of Ser. No. 464,678, Feb. 7, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,594

Int. Cl.[4] B26B *1/04*

U.S. Cl. 30—161 **4 Claims**

1. A folding knife comprising:

a handle;

a blade including a base end;

means for pivotably connecting said base end of said blade to one end of said handle to enable said blade to be swung between open and closed positions; and

blade latching means for releasably securing said blade in closed position and for releasably and positively locking said blade in open position, said blade latching means comprising:

a latch member on said handle which is shiftably movable lengthwise relative to said handle between latching and unlatching positions and having a slot cooperable with and for accommodating portions of said base end of said knife blade;

biasing means for moving said latch means lengthwise relative to said handle and for biasing said latch member into latching position when said blade is in open position;

said slot on said latch member being engageable with said base end of said knife blade to effect lengthwise shifting of said latch member from latching to unlatching position in response to movement of said knife biade; and

means on said latch member extending from said handle for manually shifting said latch member from latching to unlatching position.

4,573,269

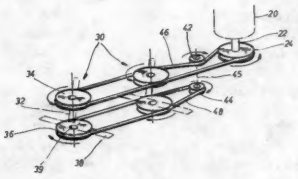
HEDGE TRIMMER

Paul C. Hernandez, 4709 Dahlia La., Victoria, Tex. 77901

Filed Aug. 8, 1984, Ser. No. 638,768

Int. Cl.[4] A01G *3/06*

U.S. Cl. 30—240 **6 Claims**



1. A trimmer comprising:

an elongated support member;

a plurality of cutting assemblies supported by and spaced along said support member;

each said cutting assembly including

a shaft substantially normal to said support member,

first and second blades respectively fixed to first and second pulleys, said first and second pulleys being concentrically mounted for independent rotation about said shaft;

first and second offset pulleys mounted for codirectional rotation with respect to the support member;

an endless first belt trained about the first offset pulley and the first pulley of each cutting assembly,

an endless second belt trained about the second offset pulley and the second pulley of each cutting assembly,

said first and second belts being configured to rotate the first pulley of each cutting assembly and its respective second pulley in opposite rotational directions.

4,573,270

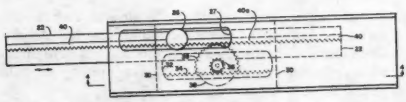
MEASURING DEVICE FOR USE IN REMOTE LOCATIONS

Dennis D'Amico, 2073 - 64th Ave. S., St. Petersburg, Fla. 33712

Filed Jan. 9, 1984, Ser. No. 690,041

Int. Cl.[4] G01B *5/02*

U.S. Cl. 33—143 K **6 Claims**



1. A device that measures distances while the device is being held in a remote location where the measurement cannot be accurately read in a convenient manner, and which stores the measurement until the device can be moved to a location more suitable for accurate reading of the measurement taken, comprising,

an elongate, substantially hollow housing configured and dimensioned to be easily grasped by a human hand,

said housing having a leading edge and a trailing edge longitudinally spaced therefrom,

an elongate ruler member slideably received within said housing, said ruler member having a leading edge,

a flat plate member slideably disposed interiorly of said housing,

means for enabling linear reciprocation of said flat plate within said housing including a slot means formed in a wall of said housing through which slot means extends a knob member that is fixedly secured to said plate and which knob member is configured and dimensioned to be manipulated by a human digit to effect its travel within said slot means and hence to effect simultaneous and corresponding travel of said flat plate,

means for transmitting the reciprocation of said flat plate to said ruler member so that said ruler member is extended from and retracted into said housing attendant such plate reciprocation,

a ledge-detecting means useful for aligning the leading edge of said housing with a ledge that is spaced from an object by a distance to be measured by said device,

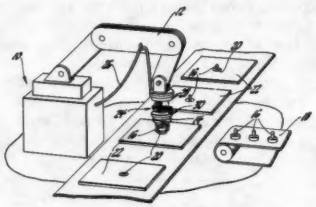
whereby displacement of said ruler member so that it extends longitudinally outward of said housing until its leading edge abuts said object produces an alignment of the leading edge of said housing and said ruler member which alignment provides a reading of the distance between said leading edge and said object, which reading can be made when said device is removed from said remote location.

4,573,271

MACHINE PERFORMANCE SENSOR

Kent R. Hamilton, West Alexandria, and John H. Kramer, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 14, 1984, Ser. No. 589,659
Int. Cl.[4] G01B 5/00
U.S. Cl. 33—169 C **2 Claims**



2. A sensor for monitoring operations performed by a manipulator which drives an end effector through at least two degrees of freedom, the sensor comprising;

input and output sections between and mounted to the manipulator and the end effector respectively for transmitting forces to the end effector and for allowing axial and rotational motion,

spring means acting between the input and output sections for maintaining the output section in a normal axial position unless overcome by a predetermined axial load, and in a normal rotary position unless overcome by a predetermined torque,

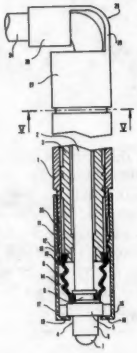
first, second, and third switches mounted on one of the sections, and cam means carried by the other of the sections for movement therewith and operatively connected to the switches including a first cam for operating the first switch whenever the output section moves from a normal position in either axial or rotary sense to yield an indication of an abnormal position, a second cam for operating the second switch when the output section moves from the normal position in the rotary sense to yield information on the mode of any abnormal position, and a third cam for operating the third switch when the output section rotates in a given direction from the normal rotary position to yield information on the direction of any abnormal rotation.

4,573,272

AXIAL MOVEMENT GAUGING HEAD

Guido Golinelli, and Mario Possati, both of Bologna, Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio (BO), Italy

Filed Sep. 27, 1984, Ser. No. 655,169
Claims priority, application Italy, Oct. 14, 1983, 3584 A/83
Int. Cl.[4] G01B 7/02
U.S. Cl. 33—172 E **19 Claims**



1. An axial movement gauging head for checking linear dimensions of mechanical parts, comprising a casing having substantially an elongated shape which defines the measurement axis, a shaft partially housed within said casing for performing a translational axial displacement with regard to the casing, a feeler coupled to an end of the shaft for touching the part, transducer means for providing a signal depending on the amount of said displacement, and limiting means for limiting said displacement and defining a rest position for the feeler, wherein the limiting means comprise a limiting element externally arranged and axially adjustable with respect to the casing through a resilient coupling, the limiting element being adapted to cooperate with said end of the shaft for defining the rest position of the feeler.

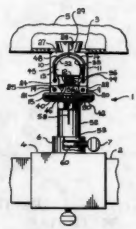
13. A gauging head for checking linear dimensions of mechanical parts, comprising a casing having substantially an elongated shape which defines a measurement axis, a shaft partially housed within said casing for performing a translational axial displacement with regard to the casing, a feeler coupled to an end of the shaft for touching the part, transducer means nfor providing a signal depending on the amount of said displacement, an electric cable for connecting the transducer means to an external electric unit, an additional element externally and removably coupled to the casing for cooperating with the cable and defining the direction of exit of the cable from the head, and locking means for defining and locking the position of the additional element with respect to the casing, wherein said additional element essentially comprises a first tubular portion defining a first direction, a second tubular portion defining a second direction and a third connecting portion having substantially an arcuate shape and defining a convex external surface and a concave internal surface, the first portion being adapted to cooperate with the casing and with the locking means for securing the additional element to the casing, the second portion housing the cable, the cable facing said concave internal surface of the third connecting portion.

4,573,273

CONNECTOR FOR A VEHICLE MEASURING SYSTEM

Leonard F. Eck, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Feb. 7, 1985, Ser. No. 699,321
Int. Cl.[4] G01B 11/27
U.S. Cl. 33—180 AT 10 Claims



1. A connector for mounting an object to a fixture hole and comprising:

(a) a block member having a through bore;

(b) confronting arms swingably mounted to said block member and having ends means for engaging said fixture hole, said arms having spaced inner surfaces providing an opening therebetween and converging toward said block member;

(c) a threaded shaft extending through said bore in said block member and having a first end for connection to said object and a second end extending into said opening between said arms;

(d) wedge means mounted on said shaft and positioned in said opening, said wedge means engaging said arms inner surfaces;

(e) biasing means urging said arms into contact with said wedge means; and

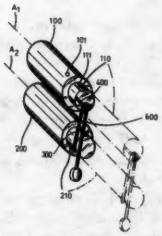
(f) a wheel means for rotating said threaded shaft, said wheel means being positioned adjacent said block member and affixed to said threaded shaft, whereby when said shaft rotates, said wedge means moves thereon and urges said arms outwardly to engage said ends means with said fixture hole.

4,573,274

METHOD APPARATUS OF MEASURING AXIAL PARALLELISM OF ROLLER PAIRS

Hans Albert, Kunigundbergasse 626, A-2380 Perchtoldsdorf, Austria

Filed Sep. 29, 1983, Ser. No. 537,274
Int. Cl.[4] G01C 9/12
U.S. Cl. 33—182 2 Claims



1. A method of determining the deviation of two respectively upper and lower cylindrical rollers from parallelism of their axes, wherein said rollers at corresponding first ends thereof have each an axial telescoped extension rod which has a free end face and is axially displaceable relative to the associated one of said rollers, the upper extension rod carrying at its free end face adjacent the perimeter thereof on a horizontal radius a pivot pin extending parallel to the axis of said upper roller and vertically swingably supporting a gauging rod and a pendulum, with said pendulum being disposed farther from said free end face of said upper extension rod than said gauging rod, comprising the steps of:

(a) locating said extension rods in respective first telescoped positions, with the upper extension rod having its free end face spaced farther from said first end of said upper roller in the axial direction than said lower extension rod to a degree permitting free swinging of said pendulum past said free end face of said lower extension rod but dictating tangential engagement of said gauging rod with the peripheral surface of said lower extension rod, and measuring the angle included between said gauging rod when the same is in engagement with said lower extension rod and said pendulum when the same is in a vertical rest position substantially perpendicular to said axes of said rollers;

(b) displacing both said extension rods to respective second telescoped positions spaced a predetermined distance from said first telescoped positions, and repeating the measurement of step (a); and

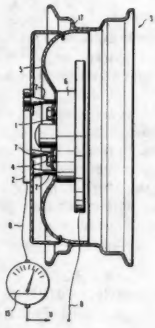
(c) calculating from the angles measured in steps (a) and (b) and from said predetermined distance the angular deviation, if any, of said roller axes from parallelism with each other.

4,573,275

ARRANGEMENT FOR THE MOUNTING OF MEASURING DEVICES OF AXLE MEASUREMENT EQUIPMENTS

Güenter Bremer, Bondorf, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,598
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316869
Int. Cl.[4] G01B 7/315, 11/275
U.S. Cl. 33—288 5 Claims



2. An installation for the mounting of measuring devices of axle-measurement equipment, comprising a fastening plate means adapted to be secured at a vehicle wheel having a wheel disk, said fastening plate means including electrically conducting abutment pin means operable to extend through the wheel disk and abutting against a plane reference surface of the vehicle axle, the abutment pin means being electrically insulated with respect to one another and longitudinally displaceable within limits against the force of abutment spring means, an electric circuit means with a signal generator means, said abutment pin means being included in said electric circuit means, and said signal generator means being operable to produce a

clearance signal only with satisfactory mechanical abutment of all abutment pin means at the reference surface.

4,573,276

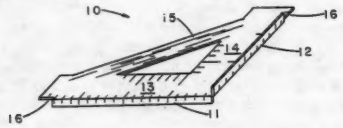
TOOL GUIDE

David J. Torczon, 714 N. 49th St., Omaha, Nebr. 68132

Continuation-in-part of Ser. No. 281,948, Jul. 10, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 447,780

Int. Cl.[4] B43L *13/00*

U.S. Cl. 33—481 **1 Claim**



1. A tool guide for directing hand tools over a workpiece comprising:

(a) integrally formed right angle base plate means comprising an integeral generally rigid "L" shaped carpenter's square having first and second legs;

(b) first guide means operably attached to said first leg for aligning said base plate means with a workpiece; and

(c) second guide means operably attached to said second leg for guiding a hand tool over said workpiece,

said right angle base plate means comprising upper and lower surfaces, a first elongate scribe edge along said first leg and a second elongate scribe edge along said second leg positioned in perpendicular relation to said first scribe edge,

said first guide means comprising a first elongate strip operably protruding from the lower surface of said base plate means in longitudinal alignment with said first elongate scribe edge,

said second guide means comprising a second elongate strip operably protruding from the upper surface of said base plate means in longitudinal alignment with said second scribe edge,

said first and second elongate strips being of shorter length than said first and second scribe edges respectively thereby to provide cutouts to facilitate clamping of said tool guide to a workpiece which is thinner than the width of said first and second elongate strips, and

a cross brace connected to and extending between said first and second legs, said cross brace being substantially coplanar with said first and second legs,

said tool guide being free of elements situated above and below said base plate means other than said first and second elongate strips whereby said tool guide is adapted for use with either the upper or lower surface of the base frame means facing upwardly.

4,573,277

ULTRAVIOLET LIGHT CURING APPARATUS

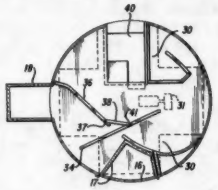
Donald L. Sudduth, 181 N. Harbor Dr., Redondo Beach, Calif. 90277

Filed Dec. 26, 1984, Ser. No. 686,441

Int. Cl.[4] F26B *15/04*

U.S. Cl. 34—4 **7 Claims**

1. Apparatus for curing ultraviolet curable inks on articles, such as bottles, and the like, comprising: a housing having a loading port and an unloading port; a common rotatable disc mounted in the housing having a horizontal top surface for carrying a plurality of the articles each in an upright position from the loading port to the unloading port; a source of ultraviolet radiation mounted adjacent to the housing for directing ultraviolet radiation into the housing so that each of the articles is carried by the common disc into the radiation; and a guide member mounted in said housing and extending at least partially across the disc in position to engage the articles carried by the disc to cause each of the articles to turn about its vertical



axis to expose its entire peripheral surface to the ultraviolet radiation.

4,573,278

APPARATUS FOR THE DEHYDRATION OF ORGANIC MATERIAL

Jose L. Ruiz-Avila, Palmwoods, Australia, assignor to AKT Consultants Pty, Limited, Queensland, Australia

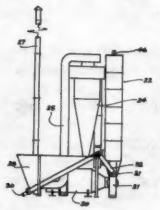
PCT No. PCT/AU83/00004, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO83/02495, PCT Pub. Date Jul. 21, 1983

Continuation of Ser. No. 537,414, Sep. 19, 1983, abandoned. This PCT application Jan. 14, 1983, Ser. No. 737,904

Claims priority, application Australia, Jan. 19, 1982, PF2335

Int. Cl.[4] F26B *17/12*

U.S. Cl. 34—168 **16 Claims**



1. Apparatus for the dehydration of organic material in which the material is passed from an agitating chamber and through a dehydrating tower by means of a stream of heated air, said apparatus characterized in that:

(a) said tower includes therein substantially upright baffle means defining on respective opposite sides thereof first and second paths for the material, the arrangement being such that substantially all of the material introduced into said tower is passed by the stream of heated air upwardly along said first path and downwardly along said second path;

(b) said substantially upright baffle means comprises a series of vertically disposed baffles mounted one above the other;

(c) said vertically disposed baffles may be aligned in a common plane such that the stream of heated air passes upwardly along said first path on one side of said plane, above the highest baffle in said series of vertically disposed baffles, and downwardly along said second path on the other side of said plane;

(d) at least some of said vertically disposed baffles are mounted so as to be individually movable out of said plane to vary the effective height of said substantially upright baffle means such as to allow the passage of the stream of heated air from said one side to said other side of said plane at selected locations below the upper edge of said highest baffle;

(e) driving means associated with said movable, vertically

disposed baffles, said driving means being actuable to a first extent to move said highest baffle out of said plane to an inoperative position so that the effective height of said substantially upright baffle means and the height of said path of the material is determined by the second highest baffle in said series of movable, vertically disposed baffles; and

(f) said driving means is actuable to a second extent to cause movement of said second highest baffle out of said plane to an inoperative position so that the effective height of said substantially upright baffle means and the height of said path of the material is determined by the third highest baffle in said series of movable, vertically disposed baffles.

4,573,279

RUNNING SOLE FOR SHOES, ESPECIALLY SPORTS SHOES, WITH ADJUSTABLE HEEL CUSHIONING

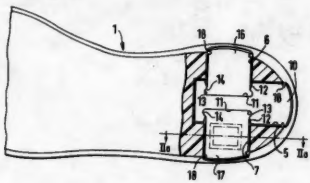
Rudolf Feurer-Zogel, Fürth, and Rudolf Vogler, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG, Fed. Rep. of Germany

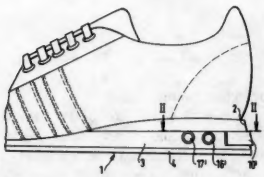
Filed Nov. 1, 1984, Ser. No. 667,351

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344535; Aug. 22, 1984, 3430845

Int. Cl.[4] A43B *21/26*

U.S. Cl. 36—35 R **13 Claims**





1. A running sole for a shoe, said sole comprising a sole body of softly resilient material in the heel region, said body having a longitudinal axis, an upper surface of said body located below the heel of the wearer and a lower surface of the body, a rear edge and two side edges of the body joined by said rear edge, a first generally longitudinally extending recess formed in the body, below the upper surface and above the lower surface and opening at one edge thereof, at least one generally transversely extending second recess in the body below the upper surface and above the lower surface and opening into at least one of said two side edges, said at least one second recess intersecting said first recess, a first springably compressible and flexible supporting body exchangeably insertable into said first recess and having a cross-section largely filling the cross-section of said first recess, a second springably compressible and flexible supporting body exchangeably insertable into said at least one second recess, and having a cross-section largely filling the cross-section of said second recess, at least one opening in one of said first and second supporting bodies and a portion of the other of said first and second supporting bodies being engageable in said at least one opening in said one supporting body.

4,573,280

PISTOL AND GRIP-AND-TRIGGER GUARD ASSEMBLY

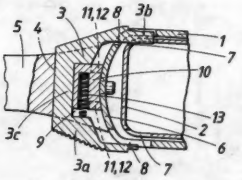
Satish K. Malhotra, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Apr. 30, 1984, Ser. No. 605,680

Claims priority, application Austria, May 4, 1983, 1637/83

Int. Cl.[4] F41C *3/00, 25/06*

U.S. Cl. 42—7 **3 Claims**



1. In a pistol comprising

a grip adapted to contain a magazine that is slidable along said grip and has lateral slots on opposite sides,

a trigger guard detachably secured to said grip and having a surface adjoining said grip,

a track extending transversely to the longitudinal direction of said grip,

a substantially U-shaped magazine catch comprising a crosspiece, which extends in said track transversely to the longitudinal direction of said grip and is slidable along said track, and first and second legs extending from said crosspiece, said first leg constituting a pushpiece, said second leg constituting a locking member adapted to extend into said grip and into one of said lateral slots of said magazine in said grip, and

a compression spring, which extends along said track and biases said magazine catch to urge said second leg into said lateral slot, whereby said first leg is operable against the force of said spring to move said second leg out of said one lateral slot so as to release said magazine for movement out of said grip,

the improvement residing in that said track is provided in said trigger guard and open toward said surface of said trigger guard,

said crosspiece is formed with a recess, which is open toward said surface of said trigger guard,

said trigger guard is formed with retaining recesses, which open into said track,

an abutment member is accommodated in said recess in said crosspiece and extends from said crosspiece as far as to said surface of said trigger guard and carries locking noses received by said retaining recesses so that said abutment member is held against movement along said track,

said compression spring bears at one end on said first leg and at another end on said abutment member, and

said grip is formed adjacent to said trigger guard with two slots, each of which receives one of said legs of said magazine catch.

4,573,281

AUDIBLE AND VISUAL INDICATOR

Louis E. Moisan, 1920 N. Main St., Lancaster, Mass. 01523

Filed Jan. 14, 1985, Ser. No. 691,115

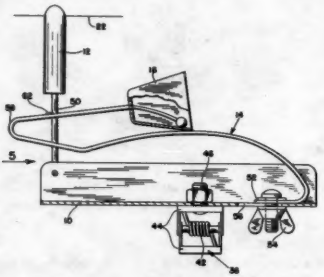
Int. Cl.[4] A01K *97/12*

U.S. Cl. 43—17 **9 Claims**

1. A fishing strike indicator comprising a channel including a bottom and sides, an elongated spring wire having a free end and a connection to the bottom of the channel at the opposite end, the wire being resilient and normally standing generally upright, an audible and visual signal at the free end of the wire, said connection being located adjacent one end of the channel, a trip comprising a member located transversely of the

channel adjacent the other end thereof and rotably mounted in the sides of the channel, an extension on the trip extending across the sides of the channel in spaced relation thereto and being swingable with the rotary member and having two positions, said extension in one position being effective to constrain the elongated wire in a loaded condition generally parallel to the channel, and in the other position releasing the wire to spring upright generally at right angles to the channel,

a releasable spring clip attached to the bottom of the channel exteriorly thereof to releasably connect the indicator as a whole to a fishing rod,



the elongated wire being doubled on itself so that the terminal end and audible signal lie between the trip and the connection of the elongated wire to the bottom of the channel, and the doubled area of the elongated wire extends past the trip in wire loading condition thereof, the trip extension engaging the doubled part of the elongated wire in set condition; and

a fishing line, a repository therefor, and resilient releasable fishing line catch means on the extension, whereby the latter is rotated away from the elongated wire upon a pull on the line and clears the doubled part of the elongated resilient wire.

4,573,282

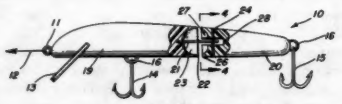
FISHING LURE

Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153

Filed Apr. 3, 1984, Ser. No. 596,381

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.15 **11 Claims**



1. An articulated fishing lure for simulating an injured minnow when pulled through water comprising at least a leading body section of substantially equal mating diameter and a trailing body section articulated to said leading body section, said leading body section having a front end and a rear end, a first cupped cavity of circular shape extending axially inwardly from the rear end of said leading body section into said leading body section, said trailing body section having a front end and a rear end, a second cupped cavity of circular shape extending axially inwardly from the front end of said trailing section into said trailing body section, a drawbar axially fixed in said leading body section adjacent the bottom of said first cupped cavity and extending rearwardly from said leading body section beyond the rear end thereof and into said second cavity and pivot means within said second cavity for pivotally connecting said drawbar to said trailing body section, said pivot means having a pivot point located between the front end of the trailing section and the centroid of said trailing section, said pivot point being located substantially to the rear of said front end of said trailing section and sufficiently forward of said centroid to prevent said lure from mechanically locking in a jack-knife position when pulled through the water, said first and second cupped cavities being of a size and shape to permit the front end of said trailing section to swing freely to either side within said first cupped cavity.

4,573,283

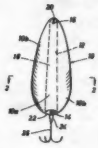
FISHING LURE

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 186,411, Sep. 12, 1980, abandoned. This application Jan. 28, 1983, Ser. No. 462,057

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.09 **13 Claims**



1. A fishing lure comprising:

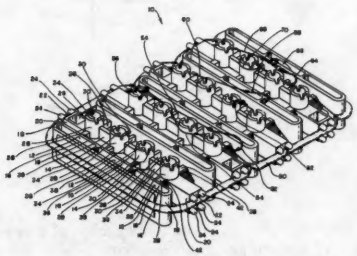
an integrally formed flexible lure body having a major lengthwise dimension and outer surfaces defining the general overall external size and configuration of said lure, said lure body comprising a central portion defining a preformed cavity extending generally lengthwise through said body, said cavity being substantially smaller than said overall external size and having a leading end and a trailing end, and said lure body having an insert opening through the exterior thereof into said cavity, said body further comprising peripheral portions adjoining said central portion and extending substantially away from said cavity in directions transverse to the lengthwise direction; and

an insert slidably mounted in said cavity but selectively removable from said cavity through said insert opening, said insert having a leading end disposed adjacent the leading end of said cavity and a trailing end disposed adjacent the trailing end of said cavity, said insert having a configuration which is asymmetrical about a longitudinally and laterally extending plane through said leading and trailing ends of said insert and which differs from that assumed by said cavity in a relaxed condition without said insert therein, such that insertion of said insert into said cavity will cause deflection of said lure body in a direction from said leading end to said trailing end and alter the external configuration of said lure body.

4,573,284
LEADER WINDING DEVICE

Richard A. Hanson, 21220 NE. 156th Ave., Woodinville, Wash. 98072

Filed Apr. 24, 1984, Ser. No. 603,448
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.2 35 Claims



1. A leader winding device adapted to have securely wound about it at least one wound leader of any given length comprising a length of wound leader line having attachment means at each end thereof, wherein each said attachment means comprises one of a hook, swivel and loop, wherein said device comprises:

a body having at least one face surface, and at least one edge surface, wherein said body defines at least one leader winding recess between at least two at least generally planar wall surfaces comprising at least one leader winding face recess within said face surface and at least one leader winding edge recess within said edge surface; wherein said leader winding recess is adapted to receive within it and protect at least a portion of said wound leader;

a plurality of spaced apart body anchor means adapted to anchor said attachment means; wherein said body anchor means are located exterior to and adjacent said leader winding recess; wherein the selection of a particular body anchor means for each of said attachment means helps to enable said wound leader of any given length to be wound on said device;

wherein said at least one wound leader is adapted to be wound alternately among at least one adjacent pair of said body anchor means; and

wherein the length of a particular route followed by said wound leader on said device varies substantially depending on said particular route followed by said wound leader with respect to said body anchor means to help to enable said wound leader of any given length to be wound on said device.

4,573,285
WINDOW INTRUSION BARRIER

Isidore Jokel, 4201 Newport H, Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 573,855, Jan. 25, 1984, Pat. No. 4,532,734. This application Jul. 30, 1984, Ser. No. 636,094
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 5 Claims

1. A safeguard system for a vertically adjustable window comprising:

(a) a barrier apparatus of adjustable horizontal length adapted for insertion into a window casement below a framed rectangular window slideably positionable within said casement, said barrier apparatus comprising:

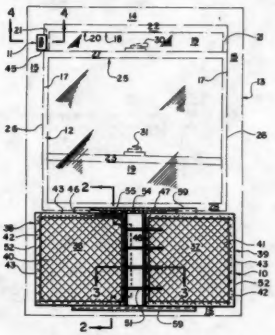
(1) two vertically disposed gridwork panels in horizontally spaced coplanar juxtaposition,

(2) first and second rigid rectangular frames adapted to border and support said panels, each frame comprising horizontally disposed upper and lower straight borders and facing and outer vertically oriented straight side borders, the facing side border of said first frame having vertically spaced guide apertures, said upper and lower borders being aligned on straight paths,

(3) horizontally directed mating posts affixed to the facing side border of said second frame and adapted to slideably penetrate said guide apertures,

(4) a first series of positioning apertures of uniform size located in at least one horizontal border,

(5) an extension arm associated with the corresponding



upper or lower horizontal border of the frame alternate to the frame having said first series of positioning apertures,

(6) a second series of positioning apertures located in said extension arm substantially matching the size of the apertures of said first series, and

(7) a coupling pin adapted to vertically interengage aligned positioning apertures of said first and second series, thereby fixing the horizontal length of said barrier apparatus, and

(b) locking means for immobilizing said slideably positionable window with respect to said casement.

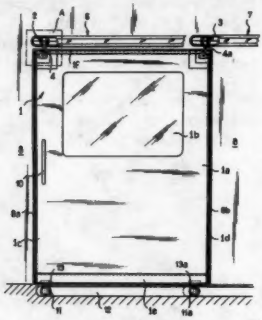
4,573,286
DEVICE FOR SUSPENDING AND GUIDING A MOVABLE PANEL, IN PARTICULAR FOR AN OBLIQUE-DISPLACEMENT SLIDING DOOR

Michel Favrel, Le Perreux, and Jean-Francois Penanhoat, Herblay, both of France, assignors to Faiveley Entreprises, Saint-Ouen, France

Filed Dec. 5, 1984, Ser. No. 678,502
Claims priority, application France, Jan. 4, 1984, 8400062
Int. Cl.[4] E05D *15/06*
U.S. Cl. 49—214 10 Claims

1. A device for suspending and guiding a movable panel (1*a*) or a similar load, especially for an oblique-displacement sliding door (1) comprising at least one rolling element (2, 3) attached to the movable panel by means of a connecting member (4, 4*a*), the rolling element comprising two rollers (Gs, Gi) in cooperating relation with rolling surfaces (6*a*, 6*b*, 6*c*, 6*d*) of a tubular guide track (6, 7) which can have rectilinear portions and curved portions, wherein the rolling surfaces (6*a*, 6*b*, 6*c*, 6*d*) of the guide track (6, 7) are located in oppositely-facing relation on each side of the connecting member (4, 4*a*) at an oblique angle with respect to said member, the profiles of the two

rolling surfaces and of the two rollers (Gs, Gi) being adapted to each other in order to prevent a movement of translation of



the rolling element in a plane transverse to said tubular guide track.

4,573,287

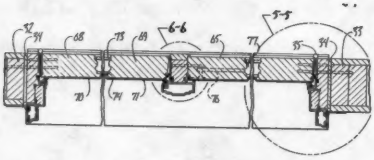
DOUBLE OPENING EXTERIOR FRENCH DOOR AND DOOR IMPROVEMENTS

Bruce A. Hagemeyer, Pella, and Mearl J. Minter, Oskaloosa, both of Iowa, assignors to Rolscreen Company, Pella, Iowa

Filed Jan. 19, 1984, Ser. No. 572,226

Int. Cl.[4] E06B *3/34*

U.S. Cl. 49—381 7 Claims



1. An exterior door assembly comprising:

a door frame including a sill, head and jambs;

a door panel including stiles, rails, and aluminum cladding on the stiles and rails, the door panel being hingedly mounted to a jamb of the door frame;

interior, air seal weatherstripping on the jambs and head of the door frame located to contact the aluminum cladding on the door panel; and

exterior, water seal weatherstriping on the jambs and head of the door frame to the exterior of the interior, air seal weatherstriping and also located to contact the aluminum cladding on the panel;

the exterior, water seal and interior, air seal weatherstripping together providing therebetween an insulating, weatherstriping air space about the jambs and head of the door frame;

the door panel further including double glazing panels defining an insulating, glazing panel air space therebetween, the double glazing panels being mounted on the stiles and rails;

the aluminum cladding on the stiles being pierced with lances between the interior, air seal weatherstripping and the exterior, water seal weatherstripping; and the stile defining air passages from the glazing panel air space to the lances.

4,573,288

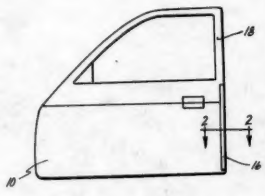
MAGNETIC DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Sep. 7, 1984, Ser. No. 648,426

Int. Cl.[4] E05F *7/00*

U.S. Cl. 49—462 7 Claims



1. A door edge guard for the trailing edge of a swinging metal closure comprising an elongate non-metallic one-piece unitary body of generally U-shaped cross section having a generally semi-circular base with inner and outer legs extending from opposite ends of the base and containing a plurality of permanently magnetized elements for attaching the edge guard magnetically to the trailing edge of the swinging metal closure in which said plurality of permanently magnetized elements comprise wires running lengthwise of the non-metallic body and distributed around the U-shaped cross section at spaced apart intervals, each of said legs and base containing at least one of said wires and in which said wires and non-metallic body are so organized and arranged in the cross section that the wires occupy a substantial portion of the thickness of said non-metallic body, being just slightly less than the non-metallic body's thickness, but are fully encapsulated so that the interior and exterior surfaces of the cross section are non-metallic.

4,573,289

APPARATUS FOR SUPERFINISHING BEARING ROLLERS

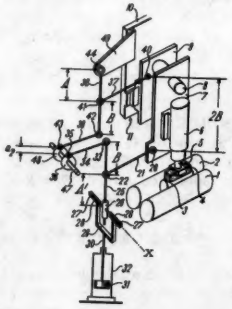
Karl Wieck, Stuttgart, Fed. Rep. of Germany, assignor to Supfina Maschinenfabrik Hentzen GmbH & Co KG, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,341

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225977

Int. Cl.[4] B24B *7/00, 19/06*

U.S. Cl. 51—57 5 Claims

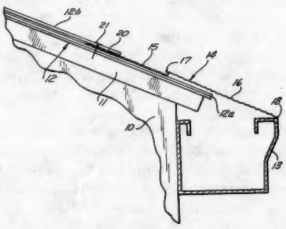


1. An apparatus for superfinishing a cylindrical workpiece, the cylindrical surface of which is rotationally symmetrical and convex defining thereby a cylindrical axis, said apparatus comprising:

a machine frame;

two rotatable rollers for imparting rotation to the workpiece about its cylindrical axis;
an oscillating honing stone;
a first plate to which the oscillating honing stone is mounted;
a second plate to which the first plate is pivotably mounted; and
first drive means and second drive means connected to the first plate and the second plate, respectively, and rotatable with respect to a common axis to impart a synchronous oscillatory motion to the first plate and the second plate, respectively, and to thereby superimpose on the oscillating honing stone a further oscillatory motion along a circular path.

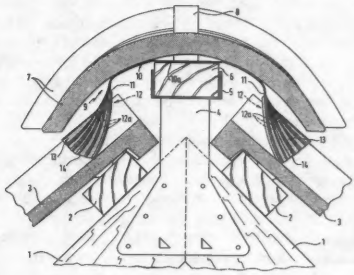
4,573,290
DRAIN SHIELD FOR EAVE GUTTERS
John H. Fleming, 53 Wildwood Ter., Glen Ridge, N.J. 07028
Filed Aug. 23, 1984, Ser. No. 643,682
Int. Cl.[4] E04D *13/06*
U.S. Cl. 52—12 **8 Claims**



1. A drain shield for eave gutters in the form of screen sections adapted to be assembled in end-to-end relation along an eave gutter, each such section being of a front to rear dimension to overlie the gutter and first course of shingles and to extend under the second course of shingles for mounting purposes, such screen section being of open screen-like structure suitably having aligned square openings measuring approximately ¼-inch on the side, each screen section being upwardly deformed intermediate its front and rear edges and at a location to align with approximately the middle one third of the first course of shingles to divide said section into a mounting portion and a gutter overlying portion, and to dispose one line of said square openings perpendicular to the plane of the screen section, the portion of the screen section overlying the gutter thereby being raised approximately ¼-inch above the mounting portion, and the perpendicularly disposed line of openings providing means for diverting water into the gutter while causing leaves and other debris to be carried over and discharged beyond the edge of the gutter.

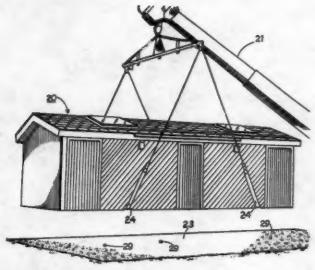
4,573,291
RIDGE OR HIP COVERING FOR TILED ROOFS
Karl-Heinz Hofmann, Mucke, Fed. Rep. of Germany, assignor to Braas & Co. GmbH, Frankfurt, Fed. Rep. of Germany
Filed Feb. 24, 1984, Ser. No. 583,184
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306837
Int. Cl.[4] B61D *17/14*
U.S. Cl. 52—43 **14 Claims**

1. A covering strip for the edge of a tiled roof having a ridge board, a plurality of covering caps fastened to said ridge board and forming an uppermost covering of said ridge board, said covering strip being located between said caps and said ridge board and comprising:
a flexible, substantially continuous support portion extending longitudinally of the strip, said strip including a pair of lateral edge portions at least one of said edge portions being subdivided into a multiplicity of transversely extending comblike teeth projecting away from said support portion of the strip,
and a longitudinally extending edge strip of flexible material secured to said one edge portion and connecting said



comblike teeth together, said edge strip is movable with said teeth
whereby engagement of said at least one edge portion of the strip with a contoured surface of a tiled roof forms a seal with said contoured surface.

4,573,292
PREFABRICATED, SELF-CONTAINED BUILDING
Charles E. Kaufman, Old Greenwich, Conn.; Marvin R. Shetler, Scotts Mills, Oreg., and William M. Sharp, Stamford, Conn., assignors to Restroom Facilities Corporation, Reno, Nev.
Division of Ser. No. 397,919, Jul. 13, 1982, Pat. No. 4,485,608. This application Aug. 31, 1984, Ser. No. 646,141
Int. Cl.[4] E04G *21/14*; E04B *1/348*
U.S. Cl. 52—79.1 **14 Claims**



1. A floorless, factory pre-assembled, relocatable building constructed for mounting on a substantially level, monolithic, concrete foundation slab, the building comprising:
A. at least two pairs of interconnected, rigidized, self-supporting wall members, each having a length substantially equal to the entire, overall, outside dimension of one side of the building and incorporating
1. a top frame portion formed by two rows of elongated plank members in stacked abutting engagement, with said abutting plank members being securely engaged to each other by both nailing and gluing along their entire length,
2. a bottom frame formed by three rows of elongated plank members in stacked, abutting engagement with said abutting plank members being securely engaged to each other by both nailing and gluing along their entire length,
3. a plurality of intermediate, substantially vertically disposed stud members interconnecting said top frame portion to said bottom frame portion, with each of said

stud members being nailed and glued on its terminating ends to said frame portions, and

4. interior, wall surface-forming sheathing securely mounted to the plank members of the wall member by nailing and gluing said sheathing to said plank members;

B. the first of said pairs of wall members incorporating mortise zones formed in each corner of each wall member by one of the rows of plank members in the top frame portion and one of the rows of plank members in the bottom frame portion having an overall length less than the length of the rows of plank members in stacked abutting engagement therewith; and

C. the second of said pairs of wall members incorporating tenon portions extending from each corner of each wall member, with said tenon portions being positioned for mating engagement with the mortise zones of said first pair of wall members and secured therein by fastening means and said tenon portions being formed by one of the rows of elongated plank members of the top frame portion and one of the rows of elongated plank members of the bottom frame portion having an overall length greater than the length of the row of plank members in stacked, abutting engagement therewith,

whereby a self-supporting, integrated, substantially unitized, rigidized assembly of wall members is attained in mating, interconnected, interengagement with each other to form a structurally rigid, reinforced building capable of being lifted in its entirety without any degradation thereof.

4,573,293

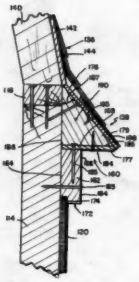
BUILDING STRUCTURE

Owen H. Park, Carmel, Ind., assignor to Heartland Industries, Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 354,511, Mar. 3, 1982, Pat. No. 4,481,744. This application Jan. 23, 1984, Ser. No. 573,117

Int. Cl.[4] E04D *11/02*

U.S. Cl. 52—92 **13 Claims**



1. A building structure, comprising outer walls, a roof including a lower border that overhangs at least one of the out walls, a frame for supporting the outer walls and roof, the frame including a frame member forming part of an upper portion of the one outer wall, the frame member having a top edge adjacent the roof and a bottom edge, a wall panel secured to the frame adjacent the bottom edge of the frame member, the wall panel forming the lower portion of the one outer wall, at least one spacer member supported on the top edge of the frame member for providing a lower border rafter extending substantially beyond and substantially below the top edge of said frame, the spacer member having a side surface forming an upper portion of the frame and a top surface at an acute angle with respect to the side surface, and roof member transverse to said spacer member and supported on the top surface of the spacer member to provide the lower border of the roof.

4,573,294

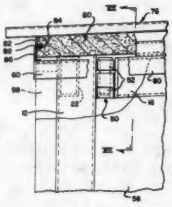
FRAMEWORK FOR BUILDING CONSTRUCTION

Robert W. Lienhard, Pittsburgh, Pa., assignor to Swiss Fabricating, Inc., Pittsburgh, Pa.

Filed Feb. 3, 1983, Ser. No. 463,522

Int. Cl.[4] E04B *7/02*

U.S. Cl. 52—93 **1 Claim**



1. A framework capable of rapid erection and disassembly for use in constructing a building comprising:

a plurality of spaced column members;

at least one socket member attached at the upper end on each side of each of said column members facing an adjacent column member, said socket member defining an axial opening;

beam members extending between adjacent column members, each of said beam members having attached at each end a socket member defining an axial opening and proportioned to releasably register with said socket member on said facing column member in alignment therewith so that said openings of such registered socket members define a pin receiving means;

a pin member releasably extendable through said pin receiving means to releasably interlock said beam member and said facing column member;

channel members so mounted at the top and bottom of each pair of column members intended to be spanned by a wall that such top and bottom mounted channel members project exteriorly from said pair of column members in vertical alignment with each other, said channel members having opposing recesses for snugly and releasably receiving vertically arranged wall panel members along the outboard side of said pair of column members; and

inwardly facing channel members mounted on said channel members at the top of each pair of column members intended to form the perimeter of said building, each said inwardly facing channel member having a free leg; and

clip means for releasably engaging said free leg for connecting roof panel members to said framework.

4,573,295

SET OF BUILDING ARTICLES AND METHOD OF MAKING AND USING THE SET TO CONSTRUCT A PREDESIGNED, PRE-ENGINEERED STRUCTURE

Rudolph P. Wilkinson, 1021 Osage St., Ardmore, Okla. 73401

Filed Jun. 13, 1984, Ser. No. 620,397

Int. Cl.[4] E04B *2/100*

U.S. Cl. 52—105 **19 Claims**

1. A set of a plurality of types of building materials for constructing a predesigned, pre-engineered structure on a foundation, comprising:

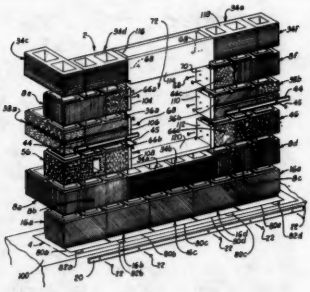
a diagram including a plurality of indicia defining the location of each of the building materials in the structure and further defining the type of building material to be used at the defined location;

a baseboard block having a first indicium identical to a first one of the plurality of indicia included on said diagram;

a standard block, connectible with said baseboard block, having a second indicium identical to a second one of the plurality of indicia included on said diagram;

a top block, connectible with said standard block, having a third indicium identical to a third one of the plurality of indicia included on said diagram; and

a full-scale pattern, separate from said baseboard block and the foundation upon which the structure is to be constructed, for receiving said baseboard block after said pattern has been placed on the foundation where the structure is to be constructed, said pattern including a substratum having indicia thereon defining the location at which said baseboard block is to be received.

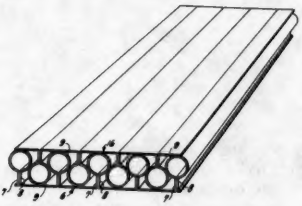


4,573,296

CONSTRUCTION PANEL AND METHOD OF PROVIDING THE SAME

John G. Wrigley, 6900 Almond Ave., No. 87, Orangevale, Calif. 95662

Filed Nov. 26, 1984, Ser. No. 675,031
Int. Cl.⁴ E04H *12/18*
U.S. Cl. 52—108 **2 Claims**



1. A construction panel comprising:

a. a deformable sheet having a plurality of identical, uniformly spaced apart, parallel forms,

(1) each form including flat portions lying in a common plane,

(2) each form including a nearly complete circular cylinder, the axis of which is parallel to said common plane and is spaced from said common plane a predetermined distance, said nearly complete circular cylinder having adjacent edges, and

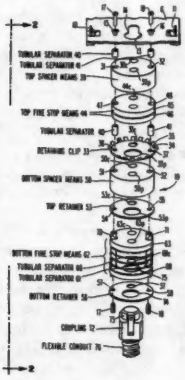
(3) each form including a pair of parallel flat fins each connected to an adjacent one of said flat portions and to an adjacent one of said edges of said cylinder, and upstanding in virtual abutment in a direction substantially normal to said plane and approximately radial to said cylinder, said fins being yieldable to the insertion of a planar portion of said deformable sheet between them.

4,573,297

ECONOMY POKE-THRU

Richard D. Benscoter, Vienna; Robert W. Hadfield, and Timothy S. Bowman, both of Parkersburg, all of W. Va., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Sep. 26, 1983, Ser. No. 535,620
Int. Cl.⁴ E04B *5/48*
U.S. Cl. 52—221 **7 Claims**



1. An improved poke-thru assembly having: a service fitting to be mounted on a building floor and a thru floor unit to be mounted in a bore in the building floor, the floor fitting to provide power and/or communication service at a work station on the floor surface and the thru floor unit to carry power and/or communication conductors from underneath the floor to the service fitting and having fire stop means for sealing the bore against passage of fire and smoke, the assembly comprising:

said service fitting including:

a flat base plate, having a top side and underside, a power opening for power conductors, a communications opening for communication conductors; a a pair of screw receiving apertures; and a gasket on the bottom of the base plate;

said thru floor unit including:

a pair of elongated mounting screws respectively disposed in said screw receiving apertures, the heads of which tightly engage said base plate;

a first pair of tubular separators respectively mounted on said mounting screws, one end of each being tightly engaged with said base plate;

a cylindrically-shaped retaining clip made of resilient material and having a seat section and a plurality of fingers around the periphery thereof, the seat section being formed to provide clearance means receiving said mounting screws and the fingers being for use in engaging the side of said bore to retain the thru floor unit therein;

each opposite end of said tubular separators being in tight engagement with said seat section;

said tubular separators separating and maintaining said base plate and said retaining clip a fixed distance apart;

top spacer means disposed in the space between said base plate and said clip and being formed to provide clearance means receiving said first pair of tubular separators;

top fire stop means made of intumescent material and disposed in the space between said base plate and said clip and being formed to provide clearance means receiving said first pair of tubular separators;

the combined thickness of said top spacer means and said

top fire stop means in a direction between said base plate and said seat section being less than the distance between the base plate and the seat section whereby neither the top spacer means nor the top fire stop means functions as a structural component of the thru floor unit;

bottom spacer means being formed to provide clearance means receiving said mounting screws, the bottom spacer means being in tight engagement with said seat section;

a cylindrically-shaped top retainer being formed to provide clearance means receiving said mounting screws, the top retainer being in tight engagement with said bottom spacer means;

a cylindrically-shaped bottom retainer having a pair of threaded apertures each comprising a nut respectively receiving the threaded portions of said mounting screws and mounting the bottom retainer thereon;

a second pair of tubular spacers respectively mounted on said mounting screws, one end of each being in tight engagement with said top retainer and each opposite end being in tight engagement with said bottom retainer, the second separators separating and maintaining the top and bottom retainers a fixed distance apart;

bottom fire stop means made of intumescent material disposed in the space between said top and said bottom retainers and being formed to provide clearance means receiving said second pair of tubular separators and the thickness of the bottom fire stop means in a direction between the top and bottom retainers being less than the distance between the top and bottom retainers whereby the bottom fire stop means does not function as a structural component of the thru floor unit;

said mounting screws being turned in said nuts to cause said plurality of tight engagements; and

said top spacer means, said top fire stop means, said retaining clip, said bottom spacer means, said top retainer, said bottom fire stop means, and said bottom retainer, each respectively having a pair of openings, one opening aligned with said power opening in said base plate and the other opening aligned with said communication opening in said base plate, the respective aligned openings providing a passageway for power conductors from underneath the floor to said service fitting and a passageway for communication conductors from underneath the floor to said service fitting.

4,573,298

BUILDING INSULATION SYSTEM

Daniel J. Harkins, Norfolk, Nebr., assignor to Thermal Design, Inc., Norfolk, Nebr.

Continuation-in-part of Ser. No. 246,209, Mar. 23, 1981, Pat. No. 4,446,664. This application May 4, 1984, Ser. No. 607,297

Int. Cl.[4] E04B *1/74*

U.S. Cl. 52—404 **23 Claims**

1. In a building including opposite end walls interconnecting opposite side walls and a ceiling covering the space between said end walls and side walls, a system for insulating said ceiling, including

a plurality of longitudinal support bands,

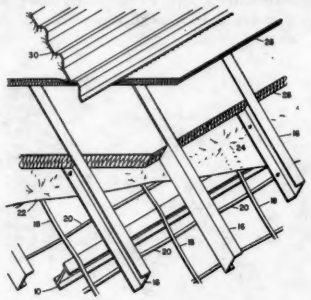
means for suspending said longitudinal support bands from said ceiling in spaced-apart relation between said end walls and in vertically spaced relation from said ceiling,

an independent suspension sheet, said sheet overlying said bands and being supported thereon,

said suspension sheet extending substantially from end wall to end wall and substantially from side wall to side wall to thereby separate said ceiling from the space below said suspension sheet,

band fastener means for connecting said bands to said ceiling at spaced apart positions along said bands,

said suspension sheet means being continuous but for the passage of said band fastener means therethrough, and



thermal insulation material disposed between said suspension sheet and ceiling and supported on said suspension sheet.

4,573,299

FLOOR COVERING ARTICLE

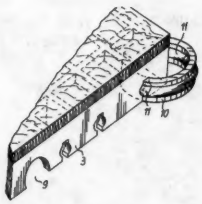
Rico Meroni, Altendorf, Switzerland, assignor to Forbo-Teppichwerk AG, Lachen, Switzerland

Filed Nov. 3, 1983, Ser. No. 548,292

Claims priority, application Switzerland, Nov. 4, 1982, 6422/82; Dec. 10, 1982, 6422/82

Int. Cl.[4] E04C *2/10*

U.S. Cl. 52—513 **18 Claims**



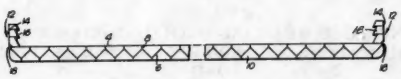
1. A platelike article intended as floor covering having an upper surface and a lower surface, and comprising a plurality of integral base elements each in the form of a latticework extending from the lower surface toward the upper surface and a rim laterally surrounding said latticework, and a textile covering material forming the upper surface and extending over and interconnecting said base elements, the rims of adjacent said base elements within said platelike article are spaced apart and form a gap traversing said platelike article, said latticework comprises first latticed bars extending from the lower surface to the side of said textile covering material closer to the lower surface, said rim having the same dimension between the lower surface and said textile covering material as said first latticed bars, and second latticed bars intersecting said first latticed bars and having a dimension extending from the side of said textile covering material closer toward the lower surface which is smaller than the comparable dimension of said first latticed bars and rim, and wherein said gaps are shaped as slits between said rims and are intended to receive guide members, said latticework and rims of said base elements are bonded by injection molding to said textile covering material, and said rims are provided with slots therethrough.

4,573,300

LIGHT TRANSMITTING WALL PANELS

Baruch J. Bezner, Tel Aviv, Israel, assignor to Dan-Pal, Upper Galilee, Israel

Filed Oct. 9, 1981, Ser. No. 310,422
Claims priority, application Israel, Oct. 20, 1980, 61314
Int. Cl.[4] E04B 1/02
U.S. Cl. 52—563 14 Claims



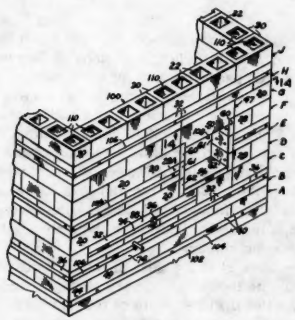
1. An extruded, modular panel unit for the construction of wall-surface portions, including light-transmitting wall-surface portions, comprising at least two sheet-like major surfaces interconnected and spaced apart by a plurality of ribs dividing the space delimited by said major surfaces into a plurality of subspaces, wherein a joining flange, extending in the direction of extrusion, projects at an angle from, and beyond, an outside face of one of said major surfaces, at each extruded edge of said panel unit, wherein, in cross section, said sheet-like major surfaces and said ribs form a truss-like structure of which said major surfaces constitute the chords and said ribs constitute the webs, and wherein each of said joining flanges has an outside and an inside face, each face being adapted to contact a corresponding face of a flange of an adjacent panel unit.

4,573,301

INTERLOCKING BUILDING BLOCKS

Rudolph P. Wilkinson, P.O. Box 1202, Ardmore, Okla. 73401

Filed Feb. 18, 1983, Ser. No. 467,709
Int. Cl.[4] E04B 5/04
U.S. Cl. 52—607 6 Claims



1. A wall, comprising:

a first course of building blocks including a first block having a first block surface in which a first groove is defined for receiving a baseboard;

a second course of building blocks, disposed above said first course, including a second block having a second block surface extending between a top surface and a bottom surface, said second block surface having a second groove defined therein in spaced relation to the boundaries at which said second block surface intersects said top and bottom surfaces; and

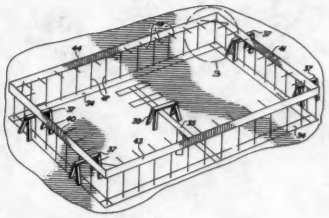
a third course of building blocks, disposed above said second course, including a third building block having a cavity defined therein and further having a third block surface in which an opening is defined, said opening communicating with said cavity and said opening being defined for receiving a pin extending from a jamb member into said cavity when said jamb member is disposed adjacent said third block surface to define part of an opening through said wall.

4,573,302

METHOD OF CONSTRUCTING HOUSES

Robert J. Caretto, 1906 E. Vinedo, Tempe, Ariz. 85284

Filed Mar. 11, 1985, Ser. No. 710,311
Int. Cl.[4] E04B 1/00
U.S. Cl. 52—742 24 Claims



1. A method of constructing houses including in combination the steps of:

providing a construction surface having a size greater than the exterior dimensions of a house to be constructed;

using a first full-scale template in the form of a flexible, dimensionally-stable sheet to mark footing and plumbing trenching lines on the lot where a house is to be erected;

excavating foundation footings and plumbing trenches in the locations marked by use of said first template;

constructing a first metal frame having external dimensions of the house to be constructed;

temporarily supporting said first metal frame above said construction surface and attaching assembled below-floor plumbing components for said house to said first frame;

moving said first frame with the attached plumbing components to said lot;

placing said first frame and attached plumbing components in position over said footing and plumbing trenches;

pouring footings for said house with said first frame in place;

marking indicia on said construction surface, showing the location of various construction items for said house, said indicia being encoded to represent and distinguish different ones of said various construction items from one another;

constructing at least a portion of said house, including the exterior walls, on a second metal frame on said building surface and including other structural components in accordance with said indicia marked on said construction surface, said second metal frame being dimensioned at least in part to fit onto said first metal frame;

moving the portion of said house on said second metal frame to said lot;

placing said second metal frame on said first metal frame; and

attaching said first and second metal frames together.

4,573,303

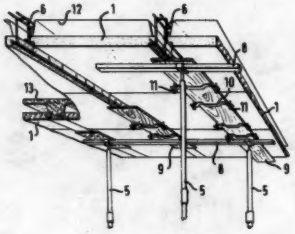
METHOD OF CASTING FLOORS AND CEILINGS OF BUILDINGS AND A PANEL FOR USE THEREIN

Andres G. Figari, Calle 77-801 Apt. 302, Bogota, Colombia

Filed Jan. 31, 1983, Ser. No. 462,434
Int. Cl.[4] E04B 1/16, 5/32
U.S. Cl. 52—743 7 Claims

1. A method of casting floors and ceilings of buildings, comprising the steps of (a) forming a frame or ribbing of parallel beams extending across the whole length or width of the floor, said beams being of an open framework construction to allow concrete to pass therethrough, (b) supporting panels

between adjacent beams by means of shoulders extending along two opposed edges of each panel engaging the beams, the bottom of the shoulders being at a height above the base of the panel, (c) temporarily securing flat bridging means against the bases of the panels to form continuous bridges spanning the gaps containing the beams between adjacent panels, (d) pouring concrete over the structure comprising the beams and panels to form, when set, a composite cast floor/ceiling having a substantially smooth and continuous lower surface, and (e)



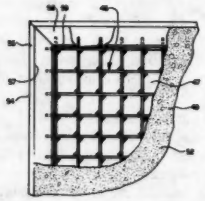
removing the bridging means, wherein each bridging means is pressed against the bases of the panels on opposed sides of the gap bridged by the bridging means partly by fixing means secured to the panels, wherein the said fixing means comprises one or more clamps anchored to the panels on opposed sides of the gap bridged by the bridging means, and wherein each clamp is anchored by means of a bolt co-operating with a nut embedded within the respective panel and accessible through a communicating bore in the base of the panel.

4,573,304

HONEYCOMB FLOOR PANEL AND THE LIKE

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Nov. 25, 1983, Ser. No. 555,142
Int. Cl.[4] E04C *2/08*
U.S. Cl. 52—807 **13 Claims**



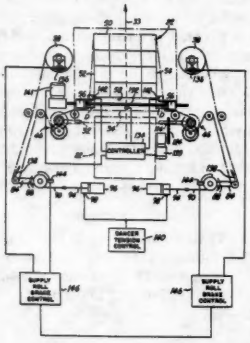
1. A honeycomb structure comprising first and second arrays of similar strips of elongated, thin metal interfitting the other array to provide a honeycomb assembly defining a multitude of cells of rectangular cross section, said strips of said first array extending substantially perpendicular to said strips of said second array, said strips of each array providing a plurality of laterally extending slots extending from one edge thereof and spaced at intervals along the length thereof, each slot providing a tab along one side thereof formed of the material of said strip and inclined from the plane thereof in the same direction to a free edge, the other side of each slot being provided by an opposed edge of said material of said strip, said opposed edge and associated tab defining an angulated throat inclined with respect to said strip having a width substantially greater than the thickness of the material of said strip, said free edge of said tab and the associated opposed edge being spaced in the direction of the length of said strips by a distance at least as small as the thickness of said strips, said arrays being assembled while the strips in each array are angulated with respect to the strips in the other array in the direction of said angulated throat and after assembly being moved to a position in which the strips in said arrays extend perpendicularly to each other and tightly engage the sides of the slots of the other array, said arrays being permanently secured to a cover sheet along at least one edge thereof to maintain the strips in each array substantially perpendicular to the strips in the other array.

4,573,305

UNIT LOAD WRAPPING WITH UNIFORM WRAP TENSION ALONG THE PERIPHERY OF THE WRAPPED LOAD

Martin M. Wildmoser, Staten Island, N.Y., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed Jul. 30, 1984, Ser. No. 635,924
Int. Cl.[4] B65B *11/00*
U.S. Cl. 53—466 **16 Claims**



1. In an apparatus of the type which wraps a unit load, at a wrapping station, with a resiliently stretchable film wrap advanced along a feed path from a supply of such film wrap to the wrapping station, with the film wrap tensioned to a desired tension, by advancing the unit load along a path of travel into a curtain of said film wrap extending laterally across the path of travel from one side to the other side thereof and closing said film wrap behind the unit load to complete a sleeve of said film wrap around the unit load, the unit load having a given lateral width between longitudinal sides, an improvement for attaining essentially uniform tension in the completed sleeve, said improvement comprising:

opposed jaws located at the sides of the path of travel and juxtaposed with the curtain, the jaws being spaced apart a distance greater than the width of the unit load;

jaw-moving means for moving at least one of the opposed jaws toward the other of the opposed jaws at a rate of movement to close the film wrap behind the unit load, the movement of said one jaw being from an initial position spaced away from the corresponding side of the unit load to an intermediate position juxtaposed in generally longitudinal alignment with said corresponding side of the unit load and thence into engagement with the other of the jaws at a closed position behind the unit load;

Position detecting means for detecting the position of at least said one of the opposed jaws relative to the unit load during said movement of said one jaw for determining the location of the one jaw at said intermediate position; and

feed means for advancing the film wrap at a first rate of advancement relative to the rate of movement of the one jaw during movement of said one jaw from the initial position to the intermediate position and responsive to the position detecting means for advancing the film wrap at a second rate of advancement in response to the location of

said one jaw at the intermediate position, as determined by the position detecting means, which second rate of advancement, relative to the rate of movement of the one jaw, is greater than the first rate of advancement during movement of said one jaw from the intermediate position to the closed position.

9. In the method of wrapping a unit load, at a wrapping station, with a resiliently stretchable film wrap advanced along a feed path from a supply of such film wrap to the wrapping station, with the film wrap tensioned to a desired tension, by advancing the unit load along a path of travel into a curtain of said film wrap extending laterally across the path of travel from one side to the other side thereof and closing said film wrap behind the unit load, between opposed jaws, to complete a sleeve of said film wrap around the unit load, the unit load having a given lateral width between longitudinal sides, the improvement for attaining essentially uniform tension in the completed sleeve, said improvement comprising the steps of:

locating the opposed jaws at the sides of the path of travel and juxtaposed with the curtain, with the jaws being spaced apart a distance greater than the width of the unit load;

moving at least one of the opposed jaws toward the other of the opposed jaws at a rate of movement to close the film wrap behind the unit load, the movement of said one jaw being from an initial position spaced away from the corresponding side of the unit load to an intermediate position juxtaposed in generally longitudinal alignmne with said corresponding side of the unit load and thence into engagement with the other of the jaws at a closed position behind the unit load;

detecting the position of at least said one of the opposed jaws relative to the unit load during said movement of said one jaw for determining the location of the one jaw at said intermediate position; and

advancing the film wrap at a first rate of advancement relative to the rate of movement of the one jaw during movement of said one jaw from the initial position to the intermediate position and advancing the film wrap at a second rate of advancement in response to the location of said one jaw at the intermediate position, as determined by said detection of the position of said one jaw, which second rate of advancement, relative to the rate of movement of the one jaw, is greater than the first rate of advancement during movement of said one jaw from the intermediate position to the closed position.

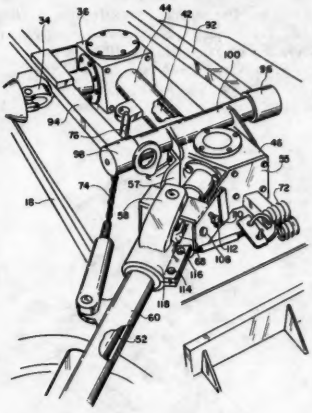
4,573,306

BELTLESS SWINGARM MOWER

Alexander Smith, and Burton D. Baggs, both of Sanford, Fla., assignors to E. E. White, Miami, Fla.

Filed Jul. 1, 1980, Ser. No. 165,220
Int. Cl.[4] A01D *75/18, 55/18*
U.S. Cl. 56—10.4 **4 Claims**

1. A multiple mower arrangement for use on a tractor, comprising a principal mower having at least one rotary blade, a power shaft running substantially the length of said principal mower and delivering rotary power to the blade or blades of said mower, a swingarm mower equipped with a rotary blade and being hingedly supported by means of a hollow arm on the outboard end of said principal mower, said arm being supported by a hollow hinge, shaft means extending through said arm and hinge, such that rotary power can be effectively transmitted without the use of belts from said power shaft to the blades of said swingarm mower, and adjustment means provided in the support for said arm, such that the angle the swingarm mower bears to the principal mower may be readily and selectively adjusted, said adjustment means permitting the



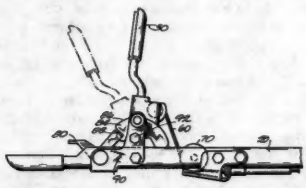
position of the swingarm mower to be adjusted heightwise as well as rotationally.

4,573,307

LAWN MOWER DEAD MAN CONTROL

Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 429,060, Sep. 30, 1982. This application Jan. 31, 1983, Ser. No. 462,624
The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.
Int. Cl.[4] A01D *75/20*
U.S. Cl. 56—11.8 **23 Claims**



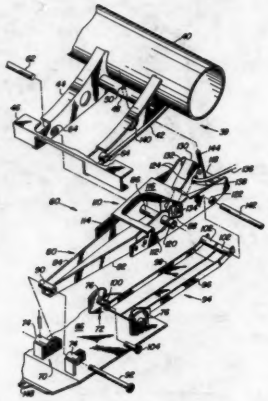
1. A lawn mower comprising a housing, a cutter blade rotatably mounted on said housing, means for selectively rotatably driving said cutter blade, a handle connected to said housing, a pivotable member connected to said handle about an axis, a control movably connected to said pivotable member, an elongated flexible member connecting said control to said means for selectively rotatably driving said cutter blade so as to selectively rotatably drive said cutter blade in response to movement of said flexible member in the direction of the elongation thereof, and means for restricting a substantial portion of said flexible member to a predetermined path along said handle and comprising a pulley rotatably attached to said handle and having a periphery located adjacent said axis and with said flexible member guided around said periphery of said pulley, whereby to afford pivotal movement of said pivotable member without effecting substantial movement of said flexible member.

4,573,308

HARVESTING PLATFORM WITH A FLOATING CUTTERBAR

Kevin L. Ehrecke, Davenport, Iowa; Jerome A. Braet, East Moline, Ill., and James H. Bassett, Davenport, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 2, 1984, Ser. No. 595,869
Int. Cl.[4] A01D *67/00*
U.S. Cl. 56—14.4 **23 Claims**



22. In a harvesting platform for a mobile harvesting machine including a transversely elongated platform frame having opposite sides, a platform floor extending between the opposite sides, and a transverse flexible floating cutterbar assembly extending between the opposite sides forwardly of the floor and operative to flex vertically to a limited degree to follow the contour of the ground, a plurality of skid plate subassemblies, each subassembly comprising:

a tilt frame for connecting to and being carried by the platform frame so as to be pivotably adjustable about a transverse pivot axis with respect to the platform frame;

a ground-engaging skid plate having a forward portion connectible to a rearward portion of the cutterbar;

a lift link having rearward and forward ends pivotally connected respectively to the tilt frame and to the skid plate;

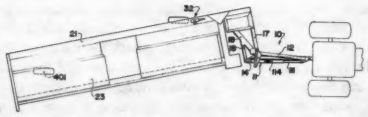
a push link spaced rearwardly from the lift link having forward and rearward ends pivotably connected respectively to the skid plate and the tilt frame, the lift link and the push link being substantially parallel to each other and forming a parallel linkage with the tilt frame and the skid plate so that, when the subassembly is connected to and carried by the platform frame, the skid plate may swing in a vertical arc without substantial change in attitude.

4,573,309

PULL-TYPE WINDROWER

Roger L. Patterson, Selkirk, Canada, assignor to Macdon Industries Ltd., Winnipeg, Canada

Filed Jul. 13, 1984, Ser. No. 630,635
Int. Cl.[4] A01B *73/00*
U.S. Cl. 56—228 **7 Claims**



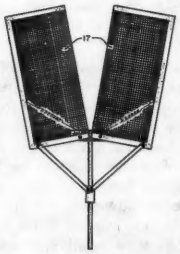
1. A pull-type swather comprising a hitch for attachment to a pulling vehicle, a frame attached to said hitch, cutting means supported upon and extending across the width of the frame for cutting a standing crop, conveying means supported upon the frame for collecting the cut crop from the cutting means into a swath for ejection from the swather, a pair of ground wheels for supporting the frame for movement across the ground, means for raising and lowering said cutting means and said conveying means relative to said ground wheels to adjust the working height thereof relative to the ground, the hitch being adjustable from a working position in which it pulls the frame in a working direction transverse to the width of the frame to a transport position in which is pulls the frame substantially at right angles to the working direction, and strut means mounting one of said ground wheels, said strut means being rotatable about an axis offset to one side of said one ground wheel, said raising and lowering means being arranged to raise said conveying means to a sufficient height and said strut means being arranged such that said one ground wheel can pivot about said offset axis to a transport position directly underlying said conveying means.

4,573,310

HORTICULTURAL AID

Bernard G. Friedel, P.O. Box 487, Hardin, Ill. 62047

Filed Nov. 13, 1984, Ser. No. 670,209
Int. Cl.[4] A01D *46/24*
U.S. Cl. 56—329 **5 Claims**



1. A horticultural aid comprising a handle, a laterally extending support bar connected to said handle, a pair of frame members having open sides facing one another, pivot means for mounting said frame members on said support bar for limited relative swinging movement of said frame members toward and away from one another, spring means continuously biasing said frame members toward one another, hand manipulable frame operating means for moving said frames relative to one another against the bias of said spring means, and elastic netting mounted in said frame members, arranged to embrace a small trunk of limb of a plant to be trimmed when said operating means is manipulated against the bias of said spring means for moving said frame members away from one another to receive said trunk or limb and released to permit the said spring means to bias the frames toward one another around said trunk or limb.

4,573,311

LAWN RAKE

Neal J. Ipema, Simpsonville, and William E. Portz, Anderson, both of S.C., assignors to True Temper Corporation, Shiremanstown, Pa.

Filed Sep. 14, 1984, Ser. No. 650,968
Int. Cl.[4] A01D *7/06*
U.S. Cl. 56—400.17 **6 Claims**

1. A lawn rake comprising:

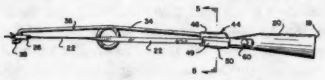
an elongated member having a hand gripping portion at one end thereof,

a rake head assembly including a socket, one end of said socket receiving and retaining the other end of said elongated member,

said rake head assembly further including a plurality of tines, one end of said tines being located in the other end of said socket,

each of said tines having a notch at said socket end for engaging a detent located in said socket at the tine receiving end,

a spreader bar disposed intermediate the tine receiving end of said socket and the opposed working ends of said tines for maintaining said tines in spaced relationship,



means for fixedly securing said tines within said spreader bar,

crimping means for anchoring said tines within the socket,

a spring clip substantially enveloping and further crimping the tine receiving end of said socket enclosing the ends of said tines therewithin, and

a stiffener spring having a pair of arms engaging said spreader bar and a base forming a loop, said spring base being interposed between said clip and the outer surface of said socket and secured thereto by said clip.

4,573,312

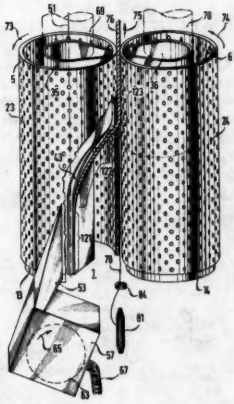
FRICTION SPINNING APPARATUS

Karl-Josef Brockmanns, Anrath, and Joachim Lünenschloss, Aachen, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 644,220

Int. Cl.[4] D01H *7/882;* **D02G** *3/36*

U.S. Cl. 57—5 **19 Claims**



1. Friction spinning apparatus, comprising oppositely-disposed, rotationally-symmetrical friction elements rotating in the same direction, said friction elements having perforated casings defining a line of closest mutual approach between said casings and two wedge-shaped regions adjacent said line of closest mutual approach, stationary suction devices disposed in said casings, said suction devices having suction apertures directed toward said perforated casings, a fiber feeding device for feeding spinning fibers along a yarn withdrawing direction, and a yarn withdrawing device for withdrawing yarn, each of said casings including a yarn formation zone receiving the spinning fibers at substantially the furthest upstream portion of said casings in said yarn withdrawing direction for continuously forming yarn, a curved transition zone downstream of said yarn formation zone, and a yarn consolidation zone downstream of said transition zone, said yarn consolidation zone being separate from and having a longitudinal axis disposed outside of said yarn formation zone, said yarn consolidation zone being disposed substantially at the furthest downstream portion of said casings.

4,573,313

METHOD AND APPARATUS FOR FEEDING A DOSED MIXTURE OF SPLICING AIR AND LIQUID INTO THE SPLICING CHAMBER OF A COMPRESSED-AIR YARN SPLICING DEVICE

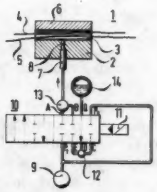
Josef Bertrams, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,964

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337895

Int. Cl.[4] B65H *69/02, 69/06;* **D01H** *15/00*

U.S. Cl. 57—22 **5 Claims**



1. Method for feeding a dosed mixture of splicing air and liquid into a splicing chamber of a compressed-air splicing device, including a valve movable from a receiving to an operating position upon receiving a splicing signal, the valve having a dosing chamber determining the quantity of splicing liquid by the volume thereof, and a mixing chamber, and an element containing a liquid supply, which comprises connecting the dosing chamber to the element containing the liquid supply prior to splicing for injecting a dosed quantity of liquid into the splicing chamber, disconnecting the dosing chamber from the element containing the liquid supply by moving the valve from the receiving to the operating position with the splicing signal, connecting the dosing chamber to the mixing chamber, and simultaneously opening the mixing chamber for the passage of splicing air to the splicing chamber.

4,573,314

YARN WETTING DEVICE PARTICULARLY FOR USE IN A TWO-FOR-ONE TWISTER

Rainer Lorenz, Nettetal-Breyell, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,867

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409233

Int. Cl.[4] D01H *1/10, 13/30;* **B05C** *1/06*

U.S. Cl. 57—296 **24 Claims**

1. A device for applying a wetting agent to traveling yarn and characterized by the conveyance of a uniform quantity of wetting agent to the yarn even when the amount of wetting agent in said device is reducing; said device comprising:

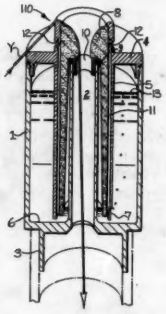
a reservoir carrying a supply of wetting agent at varying levels therein;

a yarn wetting means including a porous member having absorbent and capillary qualities and over which the yarn travels for removing wetting agent, and suction means positioned in said reservoir below the wetting agent level

for feeding the wetting agent by suction from said reservoir to said wetting member;

line system means leading into said reservoir and having an upper opening which opens into the atmosphere above said reservoir and a bottom opening located at a predetermined distance above the bottom of said reservoir which opens into the wetting agent; and

said reservoir, said line system and the wetting agent cooperating to provide means for sealing said reservoir relative to atmospheric pressure when the level of the wetting agent in said reservoir is above said bottom opening of said line system means and for transferring constant atmospheric pressure from the surface of the wetting agent to a location below the surface of the wetting agent to ensure that a uniform quantity of wetting agent is fed by said suction means from said reservoir to said wetting member as the traveling yarn removes the wetting agent.

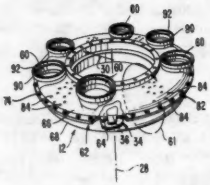


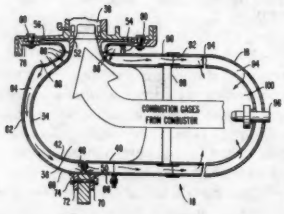
4,573,315

LOW PRESSURE LOSS, CONVECTIVELY GAS-COOLED INLET MANIFOLD FOR HIGH TEMPERATURE RADIAL TURBINE

Sigmunn Stroem, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Norway

Filed May 15, 1984, Ser. No. 610,584
Int. Cl.[4] F02C *3/00*
U.S. Cl. 60—39.37 **14 Claims**





1. A gas-cooled inlet manifold for a radial in-flow turbine, the manifold receiving combustion gases from at least one can-type combustor, the manifold comprising:

a first wall in the shape of a hollow torus having an axis, the interior space within said first toroidal wall defining in part the flow path for combustion gas from the combustor to the turbine;

a second wall in the shape of a hollow torus and surrounding said first wall, the space between said first and second walls defining in part the flow path of the coolant gas;

an annular duct positioned at the inner circle of said first and second toroidal wall and being in flow communication with said interior space, and passing through said second wall, for delivering combustion gases to the turbine, said annular duct being essentially sealed against flow communication with said coolant gas space;

a duct positioned in an axial side of said first toroidal wall for receiving combustion gases from the combustor, said duct also passing through said second wall and being in flow communication with said interior space;

coolant gas inlet means including

(i) a plurality of first coolant gas entry ports, said first ports being positioned in said second wall in an array spaced circumferentially from said combustion gas inlet duct and distributed about the circumference of the generating circle of said second toroidal wall,

(ii) a plurality of second coolant gas entry ports, said second ports being elongated slot-shaped and positioned in an axial side of said second wall, said second ports being distributed circumferentially around said second toroidal wall proximate said annular duct with the respective axes of elongation extending circumferentially and

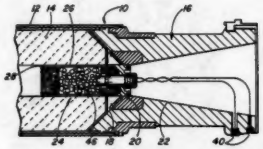
(iii) a plurality of orifice means positioned in said second wall proximate said annular duct and evenly distributed circumferentially around said second wall on both axial second wall sides of said annular duct, each of said orifice means for directing a stream of coolant gas to impinge upon a preselected portion of said first wall.

4,573,316

INTEGRATED WEATHERSEAL/IGNITER FOR SOLID ROCKET MOTOR

Christian J. L. Carrier, and Charles J. Shea, both of Ste-Foy, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Feb. 10, 1984, Ser. No. 579,205
Claims priority, application Canada, Mar. 16, 1983, 423718
Int. Cl.[4] F02K *9/95*
U.S. Cl. 60—39.823 **7 Claims**



1. A rocket motor including a nozzle having a throat, a first conical surface converging toward said throat and a second conical surface diverging away from the throat toward the rear or exit end of the motor, and an igniter comprising a tube having a closed end, the tube located in the nozzle throat with said closed end facing toward the exit end, an electrically activated igniter squib located in said tube at the closed end thereof, an ignition charge in the tube and means associated with the opposing end of said tube to hold the charge in place, first retaining means secured to said tube at a location spaced from said closed end and extending outwardly therefrom and

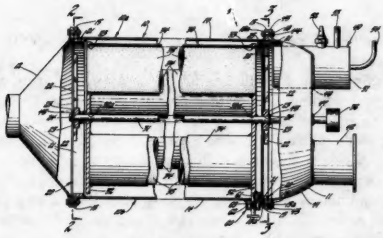
engaging said first conical surface of the nozzle, second retaining means including means defining an annular groove on said tube adjacent said closed end and a resilient annular gasket located in said annular groove and projecting outwardly therefrom and firmly and sealingly engaging said second conical surface of the nozzle such that said gasket is under radial compression to provide the sealing effect, and said engagement with said second conical surface creating force components in the axial direction of the nozzle which bring said first retaining means into close abutting relation to said first conical surface thereby to securely position and retain the igniter in the nozzle throat.

4,573,317

DIESEL EXHAUST CLEANER AND REGENERATION BURNER SYSTEM WITH INDEXING PARTICULATE TRAP

Otto A. Ludecke, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1985, Ser. No. 710,445
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—303 **2 Claims**



1. An indexing particulate filter trap and regeneration system for use with a diesel engine as on a city bus, said system including a housing means having a cylindrical intermediate housing, an exhaust inlet means at one end and an exhaust outlet at its opposite end; a shaft operatively journaled in said intermediate housing for rotation about the axis thereof and having one end thereof extending outboard of said exhaust inlet means to permit exterior rotation thereof; a cylindrical trap housing means fixed to said shaft whereby said trap housing means is sealingly and rotatably supported in said intermediate housing, said trap housing means including a plurality of circumferentially spaced apart filter supports located concentrically around said shaft; a particulate filter operatively supported in each of said filter supports; a fuel burner means operatively fixed to said exhaust inlet means with the burner outlet end thereof in operative axial alignment with one of said filter supports; and releasable detent means operatively associated with said intermediate housing and with said trap housing means to permit rotative indexing of said particulate filters sequentially into operative alignment with said fuel burner means upon rotative movement of said shaft.

4,573,318

EXHAUST ELBOW FOR MARINE PROPULSION SYSTEM

David C. Entringer; David J. Gruenwald, and Dale K. Felix, all of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 25, 1985, Ser. No. 694,948
Int. Cl.[4] F01N *3/04*
U.S. Cl. 60—310 **21 Claims**

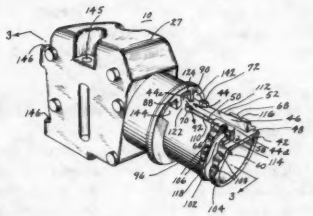
1. In a marine propulsion system having an internal combustion engine exhausted through a water jacketed exhaust elbow, an improved exhaust elbow comprising:

an intake exhaust passage communicating through a bend with a discharge exhaust passage;

water jacket means around said exhaust passages;

central channel means extending longitudinally along the exterior of said discharge exhaust passage to guide water therealong in said water jacket means to the end of said discharge exhaust passage to mix with exhaust thereat; and

means for maintaining the end tip of said discharge exhaust



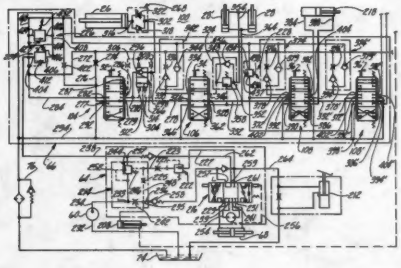
passage dry to prevent water ingestion and creeping back into said discharge exhaust passage due to pulsations of said engine, said last mentioned means comprising transition means at the end of said central channel means creating an outward draw from said central channel means to minimize break-up of outward water flow from said central channel means at said end tip of said discharge exhaust passage which may otherwise deposit water on said end tip of said discharge exhaust passage.

4,573,319

VEHICLE HYDRAULIC SYSTEM WITH SINGLE PUMP

Willard L. Chichester, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 291,653, Aug. 10, 1981, abandoned.
This application Jul. 22, 1982, Ser. No. 400,769
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—422 **24 Claims**



1. In a work vehicle of the type having at least first and second hydraulic load circuits,

first and second manually actuable selector means operatively coupled with said first and second load circuits respectively for selecting operation of circuits individually or together, said second circuit having a greater hydraulic flow requirement than said first circuit,

a positive displacement hydraulic pump,

a changeable speed prime mover connected with the pump and adapted to operate in a speed range between a low speed and a high speed,

manually actuable speed control means operatively coupled with said prime mover for changing the speed thereof to change the flow from the pump in accordance with the requirements of the load circuits,

said pump being adapted to supply the flow required by the first load circuit when the prime mover is operated at said low speed and to supply the flow required by the second load circuit when the prime mover is operated at said high speed,

the improvement comprising:

a priority demand valve having an inlet port connected with the pump, a primary outlet port connected with the first load circuit, a secondary outlet port connected with the second load circuit, and normally closed valve means between the inlet port and the secondary outlet port,

said priority demand valve including means for supplying to the primary outlet port all of the flow required by the first load circuit when the selector means are actuated individually or together with the pump running at any speed in said speed range,

said priority demand valve including means for opening said valve means when the inlet flow exceeds that required by the first load circuit with said first and second selector means actuated together and with said pump running at any speed within said speed range,

and means for diverting the excess flow from the primary outlet port to the secondary outlet port,

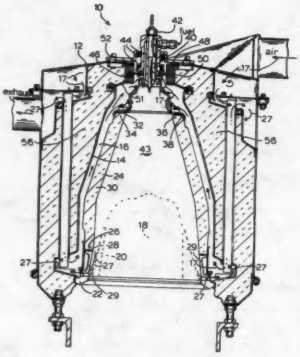
whereby the inlet flow in excess of that required by the first load circuit is supplied to the secondary outlet and thence to the second load circuit.

4,573,320

COMBUSTION SYSTEM

James Kralick, Ballston Spa, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 3, 1985, Ser. No. 730,296
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—517 **12 Claims**



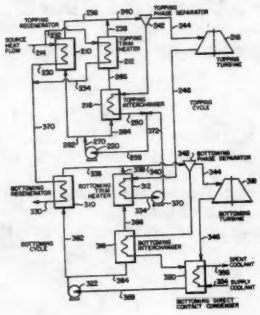
1. In an external combustion engine such as a Stirling engine and the like, having an external heat system housing in which is defined a heater space, a hollow liner formed of a ceramic material disposed in said heater space and defining a combustion chamber, and biasing means coupled to a first end of said liner and coupled with the housing so as to maintain said liner in the heater space while dampening transmission of vibrations in the housing to the liner.

4,573,321

POWER GENERATING CYCLE

Kent S. Knaebel, Dublin, Ohio, assignor to EcoEnergy I, Ltd., Columbus, Ohio

Filed Nov. 6, 1984, Ser. No. 668,755
Int. Cl.[4] F01K *25/06*
U.S. Cl. 60—649 **17 Claims**



1. A method for generating energy from a source heat flow which comprises:

(a) passing heated media comprising a solution bearing absorbed working fluid into a phase separator, said media being at a temperature and pressure adequate for said fluid to be volatilized and separated from said in said phase separator, said working fluid characterized by boiling from said solution over a range of temperatures and by direct contact condensing in said solution over a range of temperatures, the vapor pressure of said solution over said boiling point range being negligible;

(b) withdrawing said vaporous working fluid from said separator and passing same into a work zone wherein said fluid is expanded to a lower pressure and temperature to release energy;

(c) withdrawing said expanded vaporous working fluid from said work zone and passing same into a direct contact condenser;

(d) withdrawing a weak solution from said phase separator and passing same into counter-current heat-exchange relationship in an interchanger with a portion of pressurized media from said direct contact condenser;

(e) passing said heat-exchanged weak solution from step (d) into said direct contact condenser and contacting same with said expanded vaporous working fluid for absorbing said working fluid into said weak solution for re-forming said media;

(f) passing a coolant flow into said direct contact condenser for absorbing heat from the contents therein;

(g) passing said re-formed media withdrawn from said direct contact condenser into a flow transport apparatus;

(h) passing a portion of said media from said flow transport apparatus into counter-current heat-exchange relationship in said interchanger with said separated weak solution in step (d);

(i) passing said portion of said heat-exchanged media from step (h) into counter-current heat-exchange relationship in a trim heater with a portion of said source heat flow;

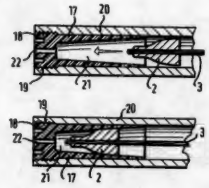
(j) passing said remaining portion of said media from step (g) into counter-current heat-exchange relationship in a regenerator with the remaining portion of said source heat flow; and

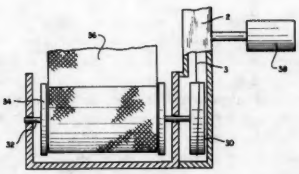
(k) combining said heated media flows from said regenerator and from said trim heater to form said heated media for step (a).

4,573,322
DRIVING DEVICE ESPECIALLY FOR RETURN STIFFENING OF A SAFETY BELT IN AN AUTOMATIC SAFETY BELT WIND-UP DEVICE

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanswerk GmbH, Aldorf, Fed. Rep. of Germany

Continuation of Ser. No. 543,086, Oct. 18, 1983, abandoned.
This application Jun. 28, 1985, Ser. No. 750,237
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238710
Int. Cl.[4] F02N *13/00*; B60R *22/28*
U.S. Cl. 60—638 6 Claims



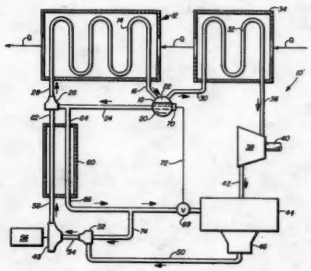


1. An apparatus comprising a reel to tighten a safety belt in response to detonation of an explosive charge, an elongated tubular member to be connected in fluid communication with the explosive charge, a piston disposed in said elongated tubular member, said piston being movable along said elongated tubular member toward one end portion of said tubular member under the influence of high pressure gas conducted from the explosive charge upon detonation of the explosive charge, flexible connector means connected with said piston and safety belt reel for rotating the safety belt reel to wind up the safety belt and for stopping movement of said piston along said tubular member with said piston spaced from the one end portion of said tubular member in the absence of breaking of said flexible connector means under the influence of force applied against said flexible connector means by said piston, and stop means disposed in the one end portion of said tubular member for stopping said piston upon breaking of said flexible connector means under the influence of force applied against said flexible connector means by said piston, said stop means including a body of resiliently deformable material having surface means for defining a cavity with an axial extent which is greater than the axial extent of said piston to enable leading and trailing end portions of said piston to enter the cavity during movement of said piston after breaking of said flexible connector means, said cavity having a side surface which tapers inwardly from an entrance to an end portion having a cross sectional size which is substantially less than a maximum cross sectional size of said piston to enable said piston to radially compress the material of said stop means as said piston moves in the cavity after breaking of said flexible connector means.

4,573,323
STEAM GENERATING APPARATUS AND METHODS

Edward A. Mock, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 13, 1982, Ser. No. 397,749
Int. Cl.[4] F01K *13/02*
U.S. Cl. 60—665 50 Claims

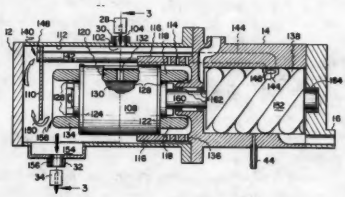


1. Apparatus comprising heat exchange means for placing a liquid in heat exchange relation with a source of heat to promote boiling of said liquid, collecting means in association with said heat exchange means for receiving heated liquid from the latter and collecting the vapor resulting from boiling of said liquid, liquid feed means for pressurizing liquid from a low pressure source thereof and for delivering a flow of said pressurized liquid to said heat exchange means, and means for recirculating liquid from said collecting means to said heat exchange means in response to said flow of pressurized liquid, said apparatus further includes a sensor responsive to a liquid level in said collecting means to produce a signal, means defining a liquid flow path from said collecting means to said low pressure liquid source, and valve means opening and closing said liquid flow path in response to said signal thereby to limit the liquid level in said collecting means, wherein said liquid feed means draws liquid from said low pressure liquid source via a jet pump for delivery to said heat exchange means, said liquid flow path including a branch upstream of said valve means which communicates with a high pressure inlet of said jet pump, whereby pressurized liquid flow from said collecting means to said liquid feed means via said jet pump entrains liquid from said low pressure liquid source and flows therewith to said liquid feed means.

4,573,324
COMPRESSOR MOTOR HOUSING AS AN ECONOMIZER AND MOTOR COOLER IN A REFRIGERATION SYSTEM

James C. Tischer, La Crescent, Minn., and James W. Larson, La Crosse, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Mar. 4, 1985, Ser. No. 708,301
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—115 19 Claims



1. A screw compressor assembly internal of which the pro-

duction of flash gas for economizer coupling a refrigeration system is integrally accomplished in conjunction with the cooling of the compressor drive motor by liquid refrigerant subcooled within the assembly, for a refrigeration system having an expansion device to which the liquid refrigerant output of a condenser is directed, comprising:

a motor housing section having an opening, said opening being in the upper portion of said motor housing section and in flow communication with said expansion device;

a compressor section defining a compression chamber and an economizer port opening into said compression chamber at a predetermined location;

a first screw rotor mounted for rotation in said compression chamber;

a second screw rotor mounted for rotation in said compression chamber, said second screw rotor being meshingly engaged with said first screw rotor;

an electric motor having a rotor and a stator penetrated by at least one passage, said motor disposed within said motor housing section and said rotor and said stator cooperating to define a gap in flow communication with the interior of said motor housing section;

means, drivingly connected to one of said first and second screw rotors, for rotatably supporting said motor rotor so that energization of said motor causes the rotation of said motor rotor, said motor rotor support means and the one of said first and second screw rotors to which said rotor support means is drivingly connected;

passage forming means opening into the interior of said motor housing section, for providing a flow path between the interior of said motor housing and said economizer port opening into said compression chamber in said compressor section; and

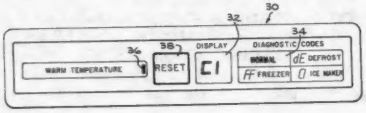
jacketing means defining an opening, said jacketing means for at least partially enclosing said motor stator and cooperating therewith to define a cavity in flow communication with said rotor-stator gap through said at least one passage penetrating said stator, said opening defined by said jacketing means being positioned vertically below said opening in the upper portion of said motor housing.

4,573,325

SELF-DIAGNOSTIC SYSTEM FOR AN APPLIANCE INCORPORATING AN AUTOMATIC ICEMAKER

Norman H. Chiu, and David A. Schneider, both of Louisville, Ky., assignors to General Electric, Louisville, Ky.

Filed Jan. 17, 1985, Ser. No. 692,075
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—129 **10 Claims**



1. In an appliance having a freezer compartment containing an icemaker of the type having an ice forming mold and an electric motor and mold heater which are energized by an external power supply during ice cube ejection cycles initiated upon detection of frozen cubes in the mold and de-energized upon completion of the ejection cycle, an icemaker diagnostic arrangement comprising:

current sensing means operative to generate an "on" signal whenever the icemaker motor and mold heater are energized; and

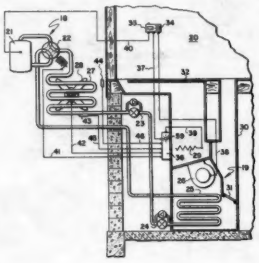
logic circuit means including timing means for measuring the elapsed time between successive "on" signals and signal means operative to generate a user discernible signal signifying a malfunction of the icemaker when an elapsed time less than that normally required to freeze cubes in the mold is detected.

4,573,326

ADAPTIVE DEFROST CONTROL FOR HEAT PUMP SYSTEM

Louis E. Sulfstede; Carl Bergt, and Robert W. Helt, all of Tyler, Tex., assignors to American Standard Inc., New York, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,057
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—156 **28 Claims**



1. A defrost control for a temperature conditioning system that includes an outdoor heat exchanger, said control comprising:

a. an outdoor heat exchanger temperature sensor;

b. an outdoor ambient air temperature sensor; and

c. means connected to both the outdoor heat exchanger temperature sensor and the outdoor ambient air temperature sensor and responsive thereto, for controlling the system to effect a defrost cycle to melt ice and frost that have collected on the outdoor heat exchanger when the heat exchanger was used as an evaporator, if the current differential temperature between the outdoor ambient air and the outdoor heat exchanger exceeds a defrost initiate value calculated after each defrost cycle as a function of:

i. a post defrost cycle differential temperature between the outdoor ambient air and the outdoor heat exchanger determined by the control means following the last defrost cycle, generally before new frost and ice formed on the outdoor heat exchanger; and

ii. a minimum such post-defrost cycle differential temperature from differential temperatures determined following previous defrost cycles as in (i), at substantially the same outdoor ambient air temperature; whereby said defrost cycle initiate value reiteratively determined by said control means, in time approaches an optimum value that changes as the temperature conditioning system changes and thus adapts to maintain an optimum defrost cycle.

4,573,327

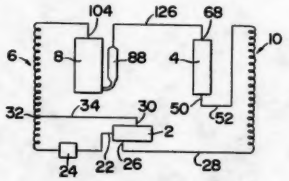
FLUID FLOW CONTROL SYSTEM

Robert Cochran, 5404 Sunset Way N., Lakeland, Fla. 33805

Filed Sep. 21, 1984, Ser. No. 652,849
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.6 **31 Claims**

1. A fluid flow control system for use with a heat exchange apparatus including a first heat exchange having a conduit disposed in heat exchange relationship relative to a fluid medium to extract heat from the heat exchange apparatus and a second heat exchange to provide heat to the heat exchange apparatus, said fluid flow control system comprising a liquid flow control device operatively coupled between the first and second heat exchange, said liquid flow control device including a liquid metering means operatively disposed within an enclosed liquid/vapor reservoir, said enclosed liquid/vapor

reservoir having a liquid port to receive liquid from the first heat exchange and a liquid metering orifice to feed liquid through said enclosed liquid/vapor reservoir formed therein, said liquid metering means comprising a movable flow restrictor disposed relative to said liquid metering orifice such that movement of said movable flow restrictor relative to said



liquid metering orifice controls the flow rate of liquid through said liquid metering orifice in response to the liquid level within said enclosed liquid/vapor reservoir to regulate the rate of flow of liquid from the first exchange, separate vapor from the liquid fed from the first exchange and maintain a predetermined level of liquid in the exit portion of the conduit.

4,573,328

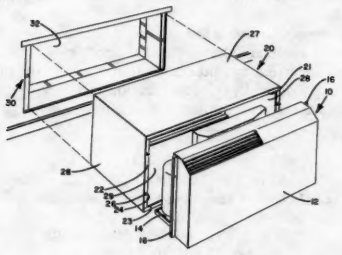
APPARATUS FOR MOUNTING A PACKAGED TERMINAL AIR CONTROLLER TO A PLASTIC WELL SLEEVE

Theodore S. Bolton, Liverpool, and John H. Michaels, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,203

Int. Cl.⁴ F25D *23/12*

U.S. Cl. 62—263 **4 Claims**



1. A non-metallic sleeve for removably mounting therein a packaged terminal air conditioning unit having an L-shaped sealing flange extending outwardly therefrom, comprising:

a box means formed by a top, a bottom, two sides, an open back, and an open front;

a pair of flanges carried by opposite sides of said box means, said flanges extending inwardly in the plane of said open front, said flanges having aperture means therethrough for receiving fastener means extending through the L-shaped sealing flange for securing the packaged terminal air conditioning unit in the sleeve,

standoff means in axial alignment with said aperture means adapted to keep said flanges in spaced relation to the L-shaped sealing flange, said standoff means has a height substantially equal to the short leg of the L-shaped sealing flange to keep said two flanges in compression when said fastener means is tightened, and

nut means for securing said fastener means, said nut means having a flange means extending from opposite sides of said box means in parallel spaced relation to each of said pair of flanges.

4,573,329

MACHINE FOR MAKING ICE-CREAM AND SIMILAR COLD PRODUCTS, WITH A REMOVABLE FREEZING CONTAINER

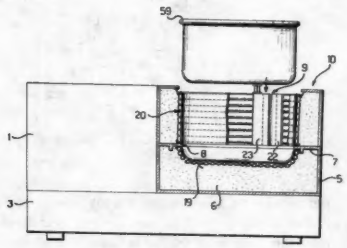
Alfredo Cavalli, Via Galileo Galilei, 9, Pessano Con Bornago (Milan), Italy

Filed Nov. 26, 1984, Ser. No. 674,754

Claims priority, application Italy, Nov. 30, 1983, 23950 A/83

Int. Cl.⁴ A23G *9/00*

U.S. Cl. 62—342 **4 Claims**



1. A machine for making ice-cream and similar cold products, comprising:

a cooling chamber formed by a substantially cylindrical cooling coil, said coil being formed by a plurality of lengths of tubing connected together in series by means of two manifold bodies which are spaced apart in a circumferential direction and define an axially extending passage therebetween, a substantially cylindrical elastic sheath, with an axially extending discontinuity facing said axially extending passage, externally surrounding said cooling coil,

a freezing container insertable in and removable from said cooling chamber,

two plate-like shields each secured to a respective manifold body and circumferentially projecting towards one another in said axially extending passage,

a layer of elastically yielding and thermally insulating material interposed between said cooling coil and said elastic sheath, said layer including a bellows portion extending inside said passage between said plate-like shields and said sheath.

4,573,330

ABSORPTION HEAT PUMP COMPRISING AN INTEGRATED GENERATOR AND RECTIFIER

Willem L. N. van der Sluys; Jacobus Pastoor, and Johannus C. M. Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,436

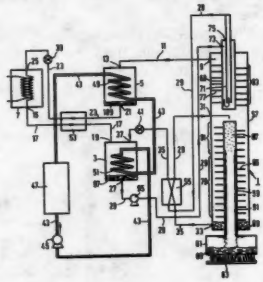
Claims priority, application Netherlands, Oct. 30, 1984, 8403281

Int. Cl.⁴ F25B *15/00*

U.S. Cl. 62—476 **4 Claims**

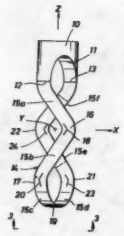
1. An absorption heat pump comprising a generator and absorber arranged in a first circuit for a solution of work medium and solvent and a condenser and evaporator arranged in a second circuit for the work medium, an outlet of the generator being connected to the condenser and an outlet of the evaporator being connected to the absorber, which is connected via an outlet to an inlet of the generator, while a vertically arranged first metal pipe passed into a holder of the generator and closed at its upper end is connected at its lower end to a vessel arranged outside the holder and forming part of the generator, which vessel contains an evaporation and condensation medium, respectively, the space between the holder and the said first pipe being connected to a supply for the solution and to an outlet for gaseous work medium, characterized in that the first pipe is filled in an upper rectifying section

with a thermally insulating gas and is wetted in a lower generating section adjoining the upper section on its inner wall with condensing work medium, while the pipe is provided both in



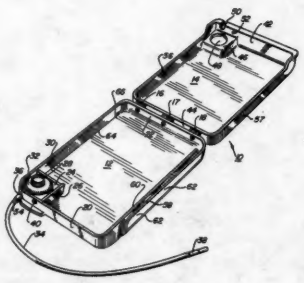
the upper and in the lower section with at least one fin which is secured to the outer wall of the pipe and is arranged so as to be clear of the inner wall of the holder.

4,573,331
THUMB RING
Merle L. Wideman, P.O. Box 5644, Dhahran, Saudi Arabia
Filed Oct. 20, 1983, Ser. No. 543,928
Int. Cl.[4] A44C *9/00*
U.S. Cl. 63—15 **5 Claims**



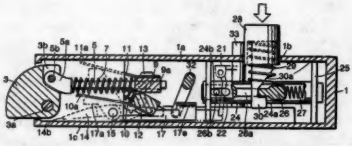
1. A ring for use on a thumb member comprising:
a base member, said base member having a vertical longitudinal plane such that when the base member is disposed on the back of a thumb member on which the ring is worn there is a general coincidence of said base member vertical longitudinal plane with a vertical longitudinal plane which extends through and bisects the thumb member;
shank means attached to said base member on opposite sides of said vertical longitudinal plane, said shank means and said base member having a generally flat interior surface defining an opening for receiving a thumb member where said opening has a central axis;
said shank means having its flat interior surface tapered with respect to the central axis for the opening,
said shank means having curvatures with respect to a vertical, transverse plane for defining four successive undulation angles where each angle is reversed with respect to an adjacent angle, said undulation angles and said tapered flat interior surface making up means whereby an interior contact surface is provided which conforms to the surface inclinations of the thumb and tends to maintain a non-rotatable relation between the ring and thumb.

4,573,332
PORTABLE SECURITY BOX
Hansan Ma, Hoffman Estates, Ill., assignor to Idesign, Inc., San Francisco, Calif.
Filed May 10, 1984, Ser. No. 608,702
Int. Cl.[4] E05B *65/52*
U.S. Cl. 70—30 **6 Claims**



1. A portable security box which comprises:
a container that can be moved from place to place comprising a separate, unattached unit formed from a pair of hinged mating sections, each section comprising a portion of the box which, when mated with the other section, form a closed box having an inaccessible interior;
a lock carried by one of the sections and having an elongated high strength member extending therefrom;
said one section including means for receiving the lock and said other section defining an opening which overlies the lock that is received by said one section, with said lock being located interior of said box when both sections are in a closed position but being accessible from exterior of the box;
said other section also defining a member opening for receiving said member whereby said member can extend from the lock carried by said one section, through the member opening defined by the other section and back to the lock, to secure the sections in the closed position.

4,573,333
ELECTRICAL DOOR LOCK
Yoon H. Choi, 46-3, Changchun-Dong, Sudaemoon-ku, Seoul, Rep. of Korea
Filed Aug. 19, 1983, Ser. No. 524,602
Int. Cl.[4] E05B *47/06*
U.S. Cl. 70—279 **6 Claims**



1. An electrically actuated door lock comprising:
a lock housing having opposed side walls;
a locking member pivotally mounted between the opposed side walls whereby said locking member is operable to pivot out of and retract into said lock housing;
a return member pivotally mounted in said housing whereby said return member is operable to pivot out of and retract into said lock housing;
a first connecting rod having one end connected to said locking member;

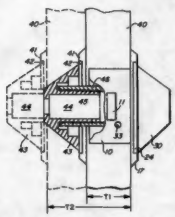
a second connecting rod having one end connected to the return member;
a first rod guide pivotally connected between the opposite side walls and having means for slidably receiving another end of said first connecting rod;
a second rod guide pivotally connected between said opposed side walls and having means for slidably receiving another end of said second connecting rod;
a first biasing means, cooperating with said first connecting rod, for applying a bias force against said locking member;
a second biasing means, cooperating with said second connecting rod, for applying a biasing force against said return member;
a first spring, fixed at one end thereof to the first rod guide and at another end thereof contactable with a surface of said return member;
a second spring fixed at one end thereof to the second rod guide and at another end thereof contactable with a surface of said locking member;
a locking lever disposed adjacent to said locking member and operable for engaging an engaging surface of said locking member to maintain said locking member in a locked position; an actuating lever operable for disengaging said locking lever from the engaging surface, said actuating lever having a shoulder at its rear end, said locking lever and said actuating lever being pivotally mounted in said housing;
means for applying a biasing force in one direction to said locking lever and for applying a biasing force in a reversed direction to said actuating lever;
an electrically operable plate for engaging the shoulder of the actuating lever;
a manually operable means, disposed adjacent to and operable for moving the electrically operable plate; and
a longitudinally movable releasing lever disposed adjacent said locking lever.

4,573,334

DEADBOLT LOCK ADJUSTABLE FOR MOUNTING IN DOORS OF VARIOUS THICKNESSES

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Jan. 24, 1983, Ser. No. 460,158
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] E05B *9/08*
U.S. Cl. 70—451 **3 Claims**



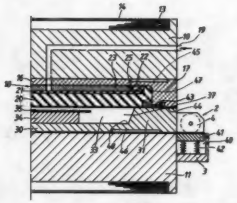
1. An improved lock comprising:
a lock body having therein a keyway and lock mechanism bore and a recessed annular segment diametrically displaced beyond a portion of the outer periphery of keyway and lock mechanism bore;
first and second slide latch recess means coupled to said lock body, one of each intercepting the extremes of said recessed annular segment;
raised element means for further defining said keyway and lock mechanism bore and providing secure access thereto;
first and second latch pins coupled to said raised element means said first latch pin being further lockingly engaged in said first slide latch recess means and said second latch pin being further lockingly engaged in said second slide latch recess means;
an annular segment slidingly coupled to said recessed annular segment in said lock body for coupling said first latch pin to said second latch pin for inhibiting rotation of said second latch pin about said first latch pin; and
latch pin locking means for inhibiting the disengagement of said first latch pin from said first slide latch recess means and, in cooperation with said annular segment, for inhibiting the disengagement of said second latch pin from said second slide latch recess means.

4,573,335

HYDRAULIC PRESS WITH PRESSURE CELL

Hans Persson, Helsingborg, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jan. 18, 1985, Ser. No. 692,716
Claims priority, application Sweden, Jan. 20, 1984, 8400271
Int. Cl.[4] B21D *22/12*
U.S. Cl. 72—63 **4 Claims**



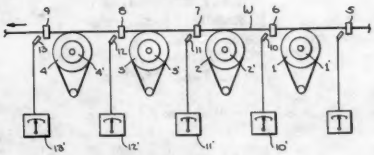
1. A press of pressure cell type which includes:
a press frame having opposed force-absorbing members defining a cavity therebetween,
a press tray movable into the said cavity and having a base on which a form block having a forming surface and a workpiece to be shaped to the forming surface are located,
a press plate supporting an expansible pressure cell within the said cavity, means to expand the pressure cell when a press tray is within the cavity to force the workpiece against the said forming surface,
the press plate and the base of the press tray, each having at least one zone of thickness transition,
wherein play is provided between at least one of the said press plate and the said base of the press tray and its confronting force-absorbing member in the vicinity of a said zone of thickness transition.

4,573,336

METHOD AND APPARATUS FOR WIRE DRAWING

Erik Hagglund, 1277 Smith Ridge Rd., New Canaan, Conn. 06840

Filed May 30, 1984, Ser. No. 615,344
Int. Cl.[4] B21C *1/04*; G01L *5/04*
U.S. Cl. 72—278 **9 Claims**



1. A continuous wire-drawing method comprising lubricating the wire with a wire drawing lubricant, drawing the wire continuously through a succession of wire drawing dies having

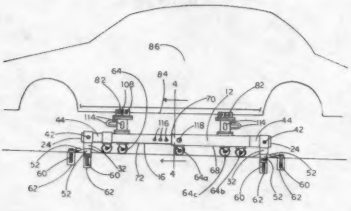
successively smaller bearing zones in which at an overheated temperature of the wire the wire or the die is damaged, while the wire is drawing continuously through the succession of wire drawing dies and at each and every die continuously individually measuring the wire temperature of the wire as close as possible to the die's bearing zone, and adjusting the drawing speed of the wire so that the highest temperature measured by any one of the dies is just below said overheated temperature.

4,573,337

FRAME TO HOLD AUTO BODIES FOR STRAIGHTENING

Thomas S. Papesh, 1915 N. Broadway, Crest Hill, Ill. 60435

Filed Oct. 15, 1984, Ser. No. 660,820
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—305 **9 Claims**



1. A frame for holding an auto body for straightening, comprising a first telescoping bar assembly for one side of said auto body, a second telescoping bar assembly for the opposite side of said auto body, a third telescoping bar assembly for the front portion of said frame connected between said first and second telescoping bar assemblies, a fourth telescoping bar assembly for the rear portion of said frame connected between said first and second telescoping assemblies, support means extending upwardly from said frame to support an auto body thereon, jaw means on said support means to grip and hold said auto body rigidly on said frame, and anchor means to anchor said frame against movement relative to the floor, said anchor means including base means to rest on said floor, upwardly extending support means extending upwardly from said base means to support said frame above said floor whereby an auto body received thereon is supported entirely above said floor, tubular frame receiving means to receive portions of said telescoping bar assemblies therethrough for sliding movement therein, and releasable securing means movable between a securing position and a releasing position to hold said portions of said telescoping bar assemblies against said sliding movement in said tubular frame receiving means when said releasable securing means is in said securing position.

4,573,338

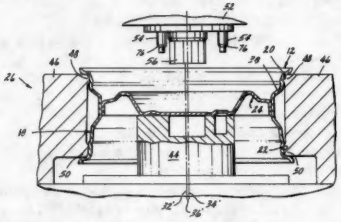
METHOD OF WHEEL MANUFACTURE FOR CORRECTING ROTATIONAL NON-UNIFORMITY OF A PNEUMATIC TIRE AND WHEEL ASSEMBLY, APPARATUS FOR PERFORMING SUCH METHOD AND RESULTING WHEEL

Anwar R. Daudi, E. Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed May 29, 1984, Ser. No. 615,074
Int. Cl.[4] B21D *53/26, 28/00*
U.S. Cl. 72—333 **6 Claims**

1. In a method of manufacturing a vehicle disc wheel having a rim with tire bead seats defining an average bead seat axis and a disc with a center hub opening and an array of bolt openings surrounding said center opening, said center and array of bolt openings being centered on axes which are eccentrically offset with respect to said bead seat axis by an amount and in a direction to locate a peak of the first harmonic of bead seat radial runout of said wheel within a predetermined angular range about a preselected location on said rim,

said method including the steps of locating said wheel by means of said bead seats and then forming said center and bolt openings in said disc with said array of bolt openings being centered on an axis which is offset with respect to the axis of said center opening,



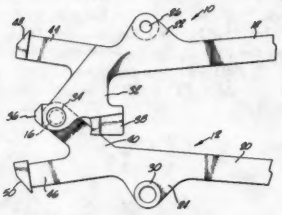
the improvement for locating said peak within said range and maintaining the amplitude of said peak within predetermined limits with respect to both said center and bolt opening array axes, said improvement comprising the step of forming said openings such that said average bead seat axis is located within a zone on said disc bounded by said angular range and by radii from said center and bolt opening array axes equal to said predetermined limits.

4,573,339

MANUAL TOOL FOR SHAPING HORSESHOES

Leslie M. Emery, 330-B 5th Ave., Venice, Calif. 90291

Filed Dec. 17, 1984, Ser. No. 682,421
Int. Cl.[4] B21D *17/02*
U.S. Cl. 72—384 **4 Claims**



4. A manual tool for shaping horseshoes, the tool having a left hand elongate member having opposite ends, and a right hand elongate member having opposite ends, said members journaled together by means of a journal pin at a central journal point; said right elongate member having:

(i) an elongate handle portion to be gripped at a first end thereof;

(ii) a nib extending laterally and outwardly (relative to said central journal point) from said elongate handle portion near the second end thereof, but below said central journal point, said nib having a plug protruding from one side thereof;

(iii) an armature extending angularly and inwardly (relative to said central journal point) from said elongate handle portion near the second end thereof, the distal end of said armature having an aperture through which said journal pin extends, and said armature having upper and lower flanges, said upper flange being located immediately above said journal pin, said lower flange being located directly but a slight distance below said journal pin, both

said flanges extending in a direction opposite to that of said plug on said nib of said elongate handle portion; and

(iv) a head section extending substantially axially above said elongate handle portion, such that said handle portion, said armature and said head section have generally a Y-shape, with said head section terminating at a point above (relative to said handle portion) said central journal pin;

and said left hand elongate member having:

(i) an elongate handle portion to be gripped at a first end thereof;

(ii) a nib which is generally the mirror image of said nib on said right hand handle portion, said nib on said left hand handle portion having plugs protruding from either side thereof;

(iii) an armature which extends angularly, inwardly and upwardly from said handle portion and having in the distal end thereof an aperture through which said journal pin extends; and

(iv) a head section which is generally the mirror image of said head section on said right hand elongate member;

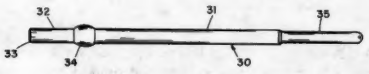
such that upon pulling said handle portions together causes said plugs on said right hand and said left hand elongate members to be brought together, and said head sections to be forced apart.

4,573,340

VALVE GUIDE LINER BROACHING TOOL

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Filed Feb. 28, 1983, Ser. No. 470,614
Int. Cl.[4] B21J *13/02*
U.S. Cl. 72—479 **11 Claims**



6. A broaching tool-driver socket combination for sizing the inside diameter of a valve guide insert for an internal combustion engine cylinder head valve guide,

(a) a broaching tool comprising:

(i) a shank for forcing the tool through said valve guide insert;

(ii) a pilot having the same longitudinal axis as said shank; and

(iii) a nonspherical broaching surface between and integral with said pilot and shank having a working diameter greater than the diameter of said shank and pilot and approximately the same as the desired inside diameter of said valve guide insert, said surface being arcuate in longitudinal cross section having a radius greater than one-half of said working diameter, said radius intersecting the longitudinal axis of said tool, said radius being measured along a first line which is perpendicular to and intersects with the longitudinal axis of said tool and which forms a right angle to and intersects with a second line tangent to said broaching surface;

(b) a driver socket comprising:

(i) a bore adapted to receive the free extremity of said shank; and

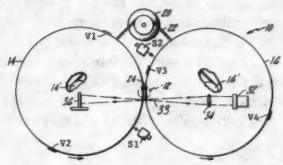
(ii) means within said bore for retaining said shank therein.

4,573,341

METHOD AND APPARATUS FOR MEASURING HYSTERESIS OF A POSITION SENSOR

Ronald C. Nonnenmacher, Woodhaven, and David V. Tinder, Dearborn, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed May 23, 1985, Ser. No. 737,140
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—1 D **7 Claims**



1. A method for measuring the hysteresis error of a position sensor for a reciprocating element, the sensor having a sensing region by which a vane relatively passes, event timing signals being provided by voltage transitions occasioned by the leading and trailing edges respectively of a respective vane passing relatively by said sensing region, and a position determination requiring two relative passes of a said vane and being determined to be the midpoint between symmetrical said timing signals, the method comprising the steps of:

moving one or more test vanes by said sensing region in a manner to simulate two passes thereby of a reciprocating vane, thereby to generate said event timing signals from said sensor;

generating, independently of the sensor, reference timing signals which are accurately indicative of the positioning of the leading and trailing edges of said one or more test vanes;

comparing a said event timing signal with a respective corresponding said reference timing signal for each of two said reference timing signals symmetrically disposed with respect to the position to be determined and determining a difference value for each of said two comparisons; and

comparing said two difference values to determine a further difference value, said further difference value being a measure of the hysteresis error.

4,573,342

APPARATUS AND METHOD FOR THE AUTOMATIC POROSITY AND PERMEABILITY TESTING OF MULTIPLE CORE SAMPLES

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sep. 14, 1984, Ser. No. 651,558
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **36 Claims**

14. An apparatus for automatically determining the permeability and porosity for a plurality of core samples, said apparatus comprising:

means containing a predetermined number of containers for releasably carrying said plurality of core samples, wherein each container carries only one core sample,

means located under one of said containers for raising the core sample in said one container upwardly and out of said one container,

means connected to said raising means and further connected to said carrying means and located directly above said one container and said raising means for holding said raised core sample, said raising means being capable of maintaining said raised core sample in sealed engagement with said holding means and being further capable of applying an axial overburden stress on the ends of said raised core sample, said holding means being further capa-

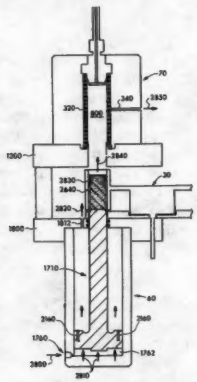
ble of applying, simultaneously with the application of said axial overburden stress, a radial overburden stress around the cylindrical sides of said raised core sample,

means in said holding means for delivering a pressurized gas to the top end of said raised core sample in order to conduct said permeability and porosity tests while said radial and axial overburden stresses are applied,

means connected to said carrying means for moving said carrying means to position the next successive holder over said raising means upon the lowering of said raised core sample back into said one container, said moving means being capable of moving said carrying means until all of said plurality of core samples have been tested,

a first formed passageway in said raising means for delivering pressurized gas,

a first piston operatively responsive to said pressurized gas in



said first passageway for upwardly lifting said core sample into said holding means, said first piston being capable of sealing said core sample in said holding means to form a test chamber for said raised core sample and for applying said axial overburden stress,

a second formed passageway in said raising means for conveying pressurized gas,

a second piston internal to said first piston and operatively responsive to the pressurized gas in said second formed passageway for selectively sealing the upper end of said first piston when said porosity test is being conducted and for opening the upper end of said first piston when said permeability test is being conducted, and

means in fluid communication with said open end of said first piston for delivering gas from said permeability test from the bottom end of said core sample outwardly from said raising means.

4,573,343

VALVE LEAK DETECTOR

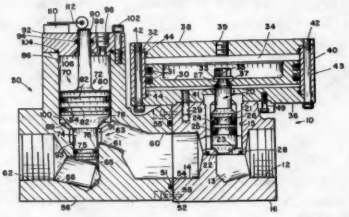
Otto A. Huiber, Kentwood, Mich., assignor to Hi-Tech Engineering, Inc., Grand Rapids, Mich.

Filed Apr. 30, 1984, Ser. No. 605,203
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—40 **14 Claims**

1. A leak detector for a valve used in a high pressure chemical injection system comprising:

a housing including conduit means for coupling to an outlet of a valve such that fluid passing through the valve will enter said conduit, said housing including a chamber communicating with said conduit;

piston means movably positioned in said chamber and movable in a first direction in said chamber in response to the entry of a non-compressible fluid in said condut; and



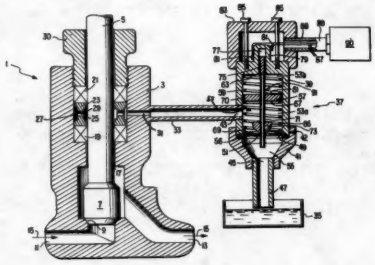
sensor means coupled to said housing and positioned to respond to movement of said piston for providing an alarm output signal.

4,573,344

VALVE PACKING LEAKAGE MONITORING DEVICE

Levi I. Ezekoye, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,295
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—46 **10 Claims**



1. A device for detecting leakage of fluid across a seal in a component connected to a pressurized fluid system, comprising:

a housing defining a chamber having a longitudinal axis, said housing including an inlet for receiving fluid leaking across the seal and an outlet;

a plate having an orifice disposed in said chamber transverse to said longitudinal axis and between said inlet and said outlet for dividing said chamber into a first chamber volume for receiving fluid through said inlet and a second chamber volume for receiving fluid from said first chamber volume through said orifice and for discharging the fluid through said outlet;

a plug movably mounted for adjusting the open area in the plane of the orifice in said plate;

positioning means connected to said plug for positioning said plug to create a predetermined open area in the plane of the orifice for permitting the fluid to exit said first chamber volume through the orifice at the same rate at which it enters said first chamber volume when the rate of fluid entering said first chamber volume is at or below a given rate, said positioning means being responsive to fluid entering said first chamber volume at a rate greater than the given rate for moving the plug away from the orifice so that the fluid exiting said first chamber volume will continue to equal the rate at which the fluid enters said first chamber volume; and

detecting means for detecting the movement of said plug,

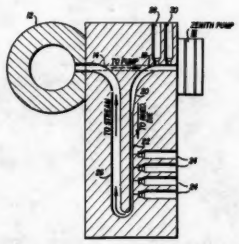
said detecting means producing an output signal corresponding to the distance moved by said plug.

4,573,345

MELT RHEOMETER CONTROL

Charles M. Krutchen, Pittsford; Raj Ranjan, Fairport, and Jan-Chin Yang, Pittsford, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,155
Int. Cl.[4] G01N *11/04*
U.S. Cl. 73—56 **3 Claims**



1. A method of measuring the viscosity of a foamable plastics melt comprising:

diverting a test sample of said plastic melt from the supply feed to an extrusion die;

elevating the pressure of said melt sample to a level higher than that said supply pressure and sufficiently high to prevent foaming of said melt;

continuously passing said pressurized melt sample through an elongated test section of a rheometer with a minimum residence time;

maintaining the pressure on said melt sample while continuously passing through said test section at a known shear rate and at a pressure level sufficiently high to prevent foaming of the melt sample;

measuring the pressure on said melt sample while passing through said test section at at least two separate locations which are spaced apart along the length thereof;

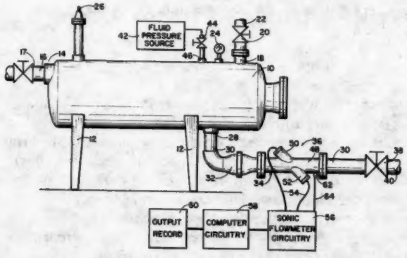
computing the viscosity of said melt by comparison of said measured pressures.

4,573,346

METHOD OF MEASURING THE COMPOSITION OF AN OIL AND WATER MIXTURE

Ellis M. Zacharias, Jr., Tulsa, Okla., assignor to Nusonics, Inc., Tulsa, Okla.

Filed Jul. 18, 1983, Ser. No. 514,576
Int. Cl.[4] G01N *29/02*; G01F *15/08*
U.S. Cl. 73—61.1 R **6 Claims**



1. A method of measuring the composition of an oil and water mixture having gas entrained therewith flowing in a pressurized stream, comprising:

(1) collecting a quantity of the mixture from the pressurized stream in a vessel having a quiescent zone;

(2) closing off flow from the pressurized stream to the vessel;

(3) venting pressure from the vessel while the mixture therein is in a quiescent state to permit at least a portion of entrained gas to separate from the mixture;

(4) repressuring the mixture within the vessel to a superatmospheric pressure;

(5) passing the mixture from the vessel while subjected to a superatmospheric pressure through a sonic apparatus;

(6) measuring the speed of sound transmission of the mixture within the sonic apparatus, which speed of sound transmission is indicative of the composition of the mixture; and

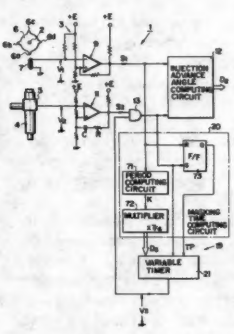
(7) calculating the water and oil composition utilizing the detected speed of sound transmission measurement.

4,573,347

APPARATUS FOR MEASURING FUEL INJECTION ADVANCE ANGLE IN DIESEL ENGINE

Akira Sekiguchi; Takeo Ichikawa; Kazuo Inoue; Kyoichi Fujimori; Yutaka Hirano, all of c/o Diesel Kiki Co., Ltd., Higashimatsuyama Plant, 13-26, Yakyu-cho 3-chome, Higashimatsuyama-shi, Saitama 355, and Seishi Yasuhara, c/o Nissan Motor Company, Limited, Tsurumi-area, 6-1, Daiko-ku-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230, all of Japan

Filed Apr. 9, 1984, Ser. No. 598,011
Claims priority, application Japan, Apr. 8, 1983, 58-61022
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **8 Claims**



1. An apparatus for measuring fuel injection advance angle of a diesel engine, comprising:

a first pulse generator for generating first detection pulses in response to the lift movement of a needle valve of a fuel injection valve;

a second pulse generator for generating second detection pulses each time the crankshaft of the engine reaches a predetermined reference angular position;

a signal generating means responsive to the first and the second detection pulses for producing an electric signal showing a desired angle range of the crankshaft;

a masking means for masking undesired signal components produced from said first pulse generator in accordance with the electric signal; and

means for detecting an injection advance angle value in accordance with the first detection pulses obtained through said masking means and the second detection pulses;

wherein said signal generating means includes a computing section for computing said desired angle range of the

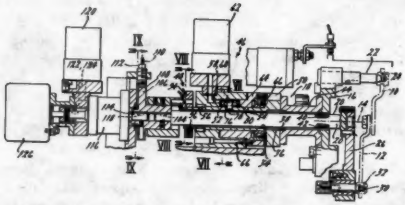
crankshaft on the basis of the generating period of the second detection pulses.

4,573,348

ANGULAR POSITIONING ACTUATOR

Robert D. Abramson, Livonia; David A. Donovan, Chelsea, and Nathaniel L. Field, Northville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 14, 1984, Ser. No. 610,217
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **7 Claims**



1. A device for actuating the shift mechanism and throttle mechanism of an automatic transmission comprising:

a first and second shafts having a common axis along at least a portion of their lengths mounted for rotation about their axes, the second shaft being fitted within the first shaft;

first and second levers carried by and extending outwardly from the axes of the first and second shafts, respectively, for connecting the shafts to the shift mechanism and throttle mechanism, respectively;

a source of pressurized fluid;

first means communicating with the fluid source and driveably connected to the first shaft for rotating said shaft about its axis;

first angular position sensing means driveably connected to the first shaft for producing a signal representative of the angular displacement of the first lever from a first reference position;

second means communicating with the fluid source and driveably connected to the second shaft for rotating said shaft about its axis; and

second angular position sensing means driveably connected to the first shaft for producing a signal representative of the angular displacement of the second lever from a second reference position.

4,573,349

NEEDLE POSITION INDICATOR FOR A FUEL INJECTION NOZZLE HOLDER

Edward A. Slindee, Elmhurst, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 28, 1984, Ser. No. 625,489
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **11 Claims**

1. A needle position indicator for a fuel injector nozzle holder comprising:

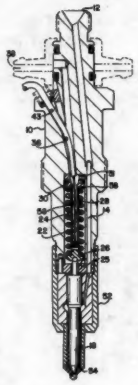
a nozzle holder body, said body having an internal chamber and a valve seat;

a needle mounted within said chamber adapted to make sealing contact with said valve seat;

spring biasing means for biasing said needle to a predetermined position in relation with said valve seat;

means for sensing the dislocation of said needle from said valve seat;

sensing means mounting bracket, mounted within said chamber surrounded by said spring; and



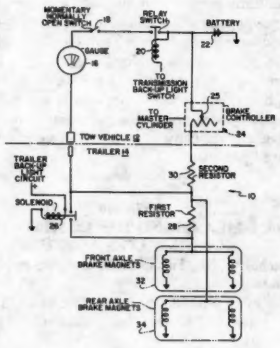
a resilient ring, surrounding said mounting bracket, radially centering said bracket within said chamber.

4,573,350

TEST SYSTEM FOR ELECTROMAGNETIC TRAILER BRAKE SYSTEM

Warren Anderson, Sturgis, Mich., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,765
Int. Cl.[4] G01L *5/28*
U.S. Cl. 73—129 **15 Claims**



1. A test system for an electromagnetic trailer brake system, comprising:

a power source;

a plurality of brake electromagnets connected to said power source;

means for regulating current flow from said power source to said plurality of brake electromagnets;

means for proportioning current flow among said plurality of brake electromagnets to control the braking effect;

means for dropping said proportioning current flow means from the electromagnetic trailer brake system;

means for actuating said dropping means;

means for monitoring the actual amount of current flow to said plurality of brake electromagnets; and

means for actuating said monitoring means, said monitoring means being inserted into the electromagnetic trailer

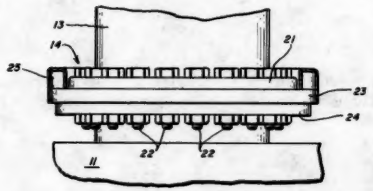
brake system and said proportioning current flow means being dropped from the electromagnetic trailer brake system when said means for actuating said dropping means is actuated so that when said means for actuating said monitoring means is actuated said monitoring means registers the current flow in the electromagnetic trailer brake system which is dependent upon only the condition of said plurality of brake electromagnets since said proportioning current flow means have been dropped from the electromagnetic trailer brake system and therefore the ability for said plurality of electromagnets to successfully stop the trailer when under tow can be determined.

4,573,351

HUB MOMENT SENSOR FOR A HORIZONTAL ROTOR AIRCRAFT

Robert P. Wiener, White Plains, N.Y., assignor to Litton Systems, Inc., Mount Vernon, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,863
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—178 H **7 Claims**



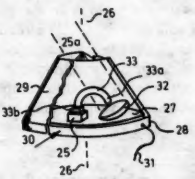
1. A hub moment sensor for an aircraft having a horizontal rotor, a rotor fixed mast for supporting the rotor above the aircraft body, and a support ring formed on the aircraft body for attachment to the rotor fixed mast, the sensor comprising;
an annular flange formed on the end of the rotor fixed mast remote from the rotor,
a plurality of bolts securing said flange to said support ring;
an annular sensing module clampled by said bolts between said flange and said support ring, and
a plurality of strain gauges positioned in said annular sensing module, said strain gauges being responsive to the elongation of said bolts whereby the moments acting on said aircraft may be sensed.

4,573,352

APPARATUS FOR MEASURING WIND-SPEED AND/OR DIRECTION

Mats E. Hurtig, Vendelsö Skolväg 282, 136 71 Handen, and Gösta K. Karlsson, Middagsvägen 12, 146 00 Tullinge, both of Sweden

Filed Jun. 8, 1984, Ser. No. 618,548
Int. Cl.[4] G01W *1/02*; G01P *5/00*
U.S. Cl. 73—189 **19 Claims**



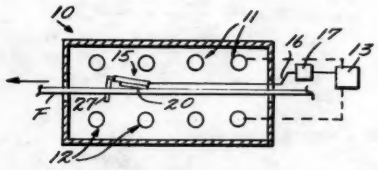
1. Apparatus for measuring windspeed and/or direction with the aid of a sound-wave transmitter and a receiver for receiving reflected sound waves, in which apparatus the sound waves are transmitted in a plurality of directions, and in which a compilation of the measuring result obtained for each measuring operation gives a measure of the speed and direction of the wind, characterized in that the transmitter and/or the receiver is, or are, arranged to rotate, so as to enable the evaluation of measuring results obtained from a multiplicity of measuring locations during revolution; and in that the transmission lobe is inclined in relation to the axis of rotation of said transmitter and/or receiver.

4,573,353

METHOD AND APPARATUS FOR OBTAINING A NOZZLE VELOCITY PROFILE OF A TENTER OVEN

Vernon T. Daniel, Oak Ridge; James R. Johnson, and Edward J. Robbins, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Geeensboro, N.C.

Filed May 6, 1983, Ser. No. 492,219
Int. Cl.[4] G01F *13/00*
U.S. Cl. 73—198 **20 Claims**



1. A method of obtaining a nozzle velocity profile of a textile treating assembly having a fabric web moving therethrough, and having a plurality of nozzles providing air flow therein, and utilizing a velocity sensing probe interconnected by a reeled wire to a monitor, comprising the steps of:
(a) without arresting the movement of the fabric web through the textile treating assembly, placing the velocity probe—with wire attached—in operative engagement with a specific point of the fabric web as the web moves through the textile treating assembly;
(b) effecting unreeling of the wire as the probe moves with the fabric web through the textile treating assembly;
(c) continuously monitoring the air velocity from the nozzles at specific points within the textile treating assembly as the fabric web moves through the textile treating assembly by monitoring the velocity data supplied by the probe;
(d) without arresting the fabric web movement, removing the probe from the web after it exits the textile-treating assembly; and
(e) reeling up the wire.

4,573,354

APPARATUS AND METHOD FOR GEOCHEMICAL PROSPECTING

Kent J. Voorhees, Golden, and Ronald W. Klusman, Evergreen, both of Colo., assignors to Colorado School of Mines, Golden, Colo.

Continuation-in-part of Ser. No. 420,362, Sep. 20, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,671
Int. Cl.[4] G01V *9/00*
U.S. Cl. 73—432 R **7 Claims**

1. A method of geochemical prospecting for volatile substances associated with or produced by underground deposits wherein said volatile substances normally migrate to the earth's surface, said method comprising:
preparing a plurality of shallow holes in the surface of the earth;
placing an integrative sample collector in each shallow hole,

each integrative sample collector comprising an adsorbent to adsorb said volatile substances;

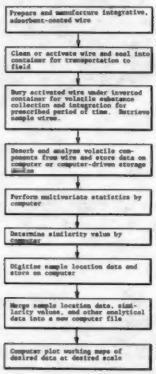
inverting a container over each integrative sample collector;

backfilling each shallow hole;

retaining the integrative sample collectors in the holes for a predetermibned time period to enable at least a portion of said volatile substances associated with underground deposit to be collected by said adsorbent;

removing said integrative sample collectors after said predetermined time period has elapsed;

analyzing a plurality of said volatile substances adsorbed on said adsorbent to obtain analytical data;


Prepare and manufacture integrative, adsorbent-coated wire
Clean or activate wire and seal into container for transportation to field
Bury activated wire under inverted container for volatile substance collection and integration for prescribed period of time. Retrieve sample wires.
Desorb and analyze volatile components from wire and store data on computer or computer-driven storage medium
Perform multivariate statistics by computer
Determine similarity value by computer
Digitize sample location data and store on computer
Merge sample location data, similarity values, and other analytical data into a new computer file
Computer plot working maps of desired data at desired scale

storing said analytical data on a computer;

objectively processing said analytical data by multivariate statistics so as to determine with some degree of confidence the nature of the underground deposit and calculating a similarity value based on the emanation of volatile substances from a known source comprising a known fingerprint; and

mapping the distribution of similarity values to the known fingerprint so as to guide the exploration for the desired underground deposits.

4,573,355

DEVICE FOR THE DETERMINATION OF THE UNBALANCE OF PROPELLERS

Wolf-Dieter Reutlinger, Novalisstrasse 5, D-6100 Darmstadt, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,138

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247503

Int. Cl.[4] G01M *1/02*

U.S. Cl. 73—455 **17 Claims**

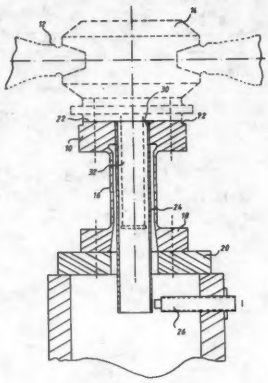
1. Device for the determination of the unbalance of propellers, comprising

(a) a propeller accommodation (**10**) permitting mounting of a propeller (**12**) with substantially vertical axis,

(b) a device for universally pivotable supporting of the propeller accommodation and

(c) sensors (**26,28**) for measuring the inclination of the propeller accommodation,

characterized in that



(d) the device for supporting the propeller accommodation (**10**) is a tubular hollow bending spring (**16**).

4,573,356

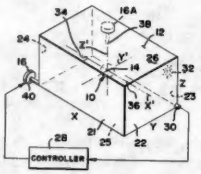
SINGLE TRANSDUCER LEVITATOR

Martin B. Barmatz, Glendale; James L. Allen, LaCrescenta, and Mark S. Gaspar, Glendale, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 3, 1984, Ser. No. 627,537

Int. Cl.[4] G10K *15/00*

U.S. Cl. 73—505 **32 Claims**



1. A method for levitating an object within a fluid-filled chamber formed by walls that form a chamber of rectangular cross-sections having lengths X, Y, and Z, where the object is to be levitated substantially along an axis X' that extends along the center of the chamber in the X direction, and where the object is denser than the fluid and occupies less than 20% of the volume of the chamber, comprising:

applying acoustic energy to said chamber of a wavelength L_{n21} given by the following equation:

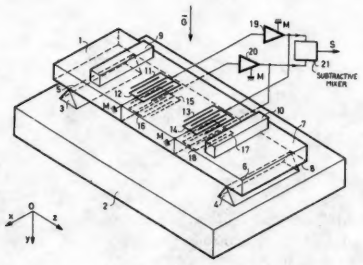
$$L_{n21} = \frac{2X}{[n^2 + 4(X/Y)^2 + (X/Z)^2]^{\frac{1}{2}}}\left(1 + 1.29\frac{V_s}{V_c}\right)$$

where n is a positive integer that is between 2 and 8, and V_s/V_c is the ratio of the volume V_s of the object and the volume V_c of the chamber.

4,573,357
ELASTIC SURFACE WAVE FORCE SENSOR

Paul L. Meunier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 16, 1984, Ser. No. 610,859
Claims priority, application France, May 20, 1983, 83 08428
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R **14 Claims**

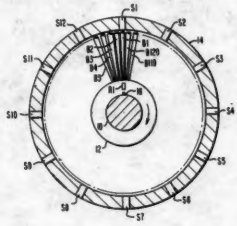


1. An elastic surface wave force sensor comprising a plate having first and second parallel faces, means for applying bending forces to be measured to the first face of the plate, elastic surface wave oscillator measuring means disposed on said parallel faces and detecting bending stresses created in the parallel faces by the forces to be measured, said plate resting its second face on two simple pivot bearing supports, said applying means being situated between said two supports so as to define an iso-stress zone in which said oscillator means are placed, and said supports providing uniform stress to said plate between said two supports when a force is applied.

4,573,358
TURBINE BLADE VIBRATION DETECTION APPARATUS

Michael C. Luongo, Brookhaven, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,528
Int. Cl.[4] G01H *11/00*; G01M *1/22, 13/00*
U.S. Cl. 73—660 **20 Claims**



1. Blade vibration detection apparatus for detecting vibration of a blade in a rotating blade row of a machine, comprising:

(A) a plurality of sensors disposed about said blade row with each sensor being operable to provide an output signal upon relative passage of a blade;

(B) signal conditioning means responsive to said sensor output signals and operable to provide respective corresponding sensor pulse signals;

(C) means for selecting a particular blade to be monitored;

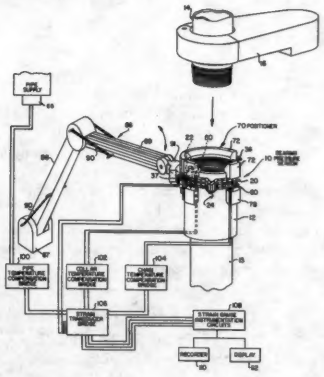
(D) means for sequentially combining all of the sensor pulse signals caused by said selected blade as it passes the respective sensors, to derive a pulse train signal modulated as a function of any vibration of said selected blade; and

(E) detection circuitry including FM detection means operable to demodulate said pulse train signal to derive a blade vibration indicative signal.

4,573,359
SYSTEM AND METHOD FOR ASSURING INTEGRITY OF TUBULAR SECTIONS

Kenneth J. Carstensen, 2901 Laurel, Odessa, Tex. 79762

Filed Jul. 2, 1980, Ser. No. 165,246
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—761 **31 Claims**

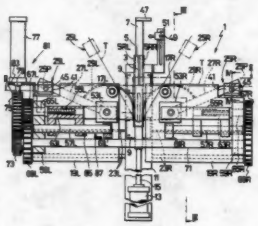


1. A mechanism for sensing the necessary and sufficient engagement of one threaded cylindrical member within another comprising encircling means including a high tensile strength section having a predetermined high resistance to elongation disposed about the outer periphery of the outer cylindrical member for sensing the outward deformation thereof in the threaded region in response to threading of the inner cylindrical member, said encircling means including a short span longitudinally deformable member operable within its elastic limits and having a smaller cross section and a lower resistance to elongation than the high tensile strength section, such that outward deformation of the cylindrical member provides a corresponding total extension of the deformable member within its yield limits and comprising chain link means for conforming to the periphery of the outer cylindrical member, said chain link means having only a plurality of point contact surfaces in contact with said outer cylindrical member, and including separable means for readily attaching and detaching the encircling means relative to the outer cylindrical member, and means for adjustably controlling the initial tension of the encircling means about said cylindrical member, said encircling means being disposed symmetrical with a central plane that intersects with and is normal to the cylindrical member at a mid-region of the threaded portion thereof, the encircling means spanning a longitudinal band of the cylindrical member and the central plane being disposed such that the ratio of the average wall thicknes of the inner and outer cylindrical members is substantially unity in the region directly opposite the encircling means, and means comprising strain sensing means disposed in substantially symmetrical relation to said plane and coupled to said deformable member for sensing the elongation in said deformable member.

4,573,360
BENDING TEST APPARATUS

Akiyoshi Yoneda, Akashi, Japan, assignor to Amada Company, Limited, Japan

Filed Mar. 5, 1984, Ser. No. 586,038
Claims priority, application Japan, Mar. 4, 1983, 58-30401[U]
Int. Cl.[4] G01N *3/20*
U.S. Cl. 73—850 15 Claims

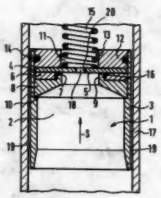


1. A bending test apparatus comprising:
first guide means mounted on the apparatus and extending in a first direction;
first bending means movable on the first guide means in the first direction to bend a test piece to a degree;
second guide means mounted on the apparatus and extending in a second direction;
and a pair of second bending means is movable on the second guide means in the second direction to further bend the test piece which has been bent by the first bending means.

4,573,361
FLOAT-TYPE FLOWMETER

Klaus Kobold, Sodener Strasse 120, 6233 Kelkheim, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 657,964
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336161; Jul. 6, 1984, 3424870
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.71 52 Claims

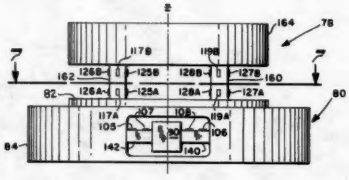


1. A float-type flowmeter comprising:
a tubular housing adapted to have flow therethrough a fluid medium the flow of which is to be measured; and
a spring-loaded float positioned within said housing and adapted to be lifted axially therein by the flow of the medium, with a ring-shaped gap being defined between said float and the inner surface of said housing, said float comprising a hollow cylinder defining axially therethrough an inner flow channel, and an orifice plate extending across said flow channel, said orifice plate having therethrough an orifice defining the narrowest part of said flow channel, said orifice remaining open during axial movement of said float within said housing, and the ratio of the thickness of said orifice, measured axially of said cylinder, to the diameter of said orifice, measured transversely of said cylinder, for flow rates of the fluid medium of approximately 0.1 to 5.0 l/min, not exceeding 0.5.

4,573,362
MULTI-AXIS LOAD TRANSDUCER

Kishan D. Amlani, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 9, 1984, Ser. No. 629,299
Int. Cl.[4] G01L *5/16, 1/22*
U.S. Cl. 73—862.04 6 Claims

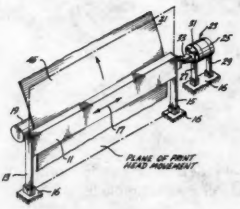


1. A multi-directional load transducer comprising:
(a) an integrally formed member having,
(i) an outer annular reaction portion for transmitting force,
(ii) an inner disc portion disposed within said annular portion, said disc portion having a plurality of radially outwardly extending spokes each having a plurality of elongated generally thin webs extending outwardly therefrom oppositely in a direction normal to the radius of said disc portion, said webs having the outward ends thereof joined with said annular portion such that said inner disc is suspended from said annular portion by said webs,
(iii) a plurality of upstanding generally elongated posts extended from said disc portion in a direction axially of said annular portion,
(iv) a common force receiving block member having the outward ends of said posts joined thereto for supporting said block member upon said disc portion;
(b) first strain gage means disposed on the surfaces of said posts for sensing bending strains in said posts; and
(c) second strain gage means disposed on the surfaces of said webs for sensing bending strains in said webs.

4,573,363
VIBRATION ISOLATING COUPLING

Warren J. Shin, Kent, Wash., assignor to Mannesmann Tally Corporation, Kent, Wash.

Filed Oct. 17, 1983, Ser. No. 542,523
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—1 SS 20 Claims



1. In a system wherein the movable element of a linear actuator is coupled to a carriage supported by flexures for shuttling the carriage back and forth in a plane of movement, said plane of movement defined by the flexures that support the carriage, the improvement comprising:
a vibration isolating coupling for coupling said movable element of said linear actuator to said carriage at an interface plane, said vibration isolating coupling comprising a

plurality of protrusions whose outer ends define said interface plane, said plurality of protrusions lying on opposite sides of said plane of movement; and,

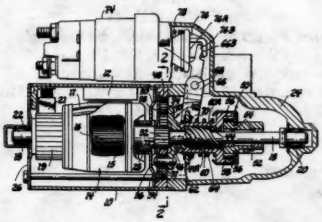
attachment means for joining said carriage to said movable element of said linear actuator at said interface plane via said protrusions such that the only areas of physical contact between said movable element of said linear actuator and said carriage occur at the ends of said protrusions that define said interface plane.

4,573,364

GEAR REDUCTION STARTER DRIVE

David E. Givan, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1984, Ser. No. 640,939
Int. Cl.⁴ F02N *15/06*
U.S. Cl. 74—7 E **5 Claims**



1. An electric cranking motor drive comprising, an electric cranking motor having housing means, an armature and a shaft fixed to the armature, said shaft rotatably supported by said housing means and having a first portion extending in one direction from said armature and a second portion extending in an opposite direction from said armature, said first and second portions rigidly connected to each other and to said armature, a driven member having a tubular portion disposed about and rotatably supported by said second portion of said shaft, said second portion of said shaft extending entirely through said driven member, reduction gearing connecting said shaft and said driven member comprising a gear connected to said second portion of said shaft for driving said driven member from said second portion of said shaft through said gearing, a pinion slidably and rotatably supported by said second portion of said shaft, a sleeve connected to said pinion disposed about at least a portion of said driven member, said sleeve being slidable axially relative to said driven member and being rotatably driven thereby, whereby said pinion can be shifted axially relative to said shaft and can be rotatably driven by said sleeve and driven member, and means coupled to said sleeve for shifting said sleeve axially relative to said driven member and shaft.

4,573,365

POWER TRANSMISSION

Reed H. Kennard, Bixby, and Lewis R. Miller, Tulsa, both of Okla., assignors to Vickers, Incorporated, Troy, Mich.

Filed Feb. 23, 1984, Ser. No. 582,528
Int. Cl.⁴ F16H *37/00*
U.S. Cl. 74—15.8 **5 Claims**

1. A shifter mechanism for a power take-off device comprising a housing member which includes an opening between spaced walls closed,

said shifter mechanism comprising a cover housing adapted to close the opening of the housing member power take-off of a power take-off device,

a trigger member,

said trigger member having an integral axial portion,

said cover housing having an opening through which said axial portion extends,

lever means engaged with the portion of said axial portion which is external of the housing for rotating the trigger member,

said trigger member including an integral transverse trigger plate,

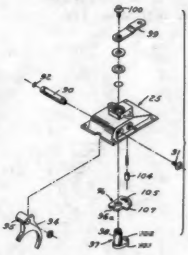
a yoke plate rotatably mounted on the axial portion of said trigger member,

said yoke plate extending transversely of the axis of said axial portion of the trigger member,

a yoke,

means for mounting said yoke for movement along an axis transverse to the axis of said axial portion of said trigger member,

said yoke plate including a peripheral notch into which a portion of the yoke extends,



said yoke plate including spaced openings connected by a slot,

a spring loaded detent mounted in said cover housing and selectively engaging one of said openings,

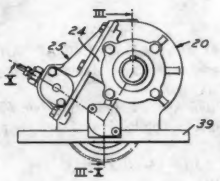
said trigger plate of said trigger member having an cam extending into said slot in said yoke plate such that when the trigger member is rotated, said detent is moved so that the yoke plate can be moved to, in turn, cause movement of the yoke by engagement with the notch so that the yoke translates axially between a position wherein only one of a pair of gears is engaged and a position wherein both gears are engaged.

4,573,366

POWER TRANSMISSION

Reed H. Kennard, Bixby, Okla., assignor to Vickers, Incorporated, Troy, Mich.

Filed Feb. 23, 1984, Ser. No. 582,921
Int. Cl.⁴ F16H *37/00*
U.S. Cl. 74—15.8 **34 Claims**



22. A power take-off device comprising

a die cast housing,

a plurality of shafts rotatably mounted in parallel spaced relation in openings in said housing,

gears on said shafts adapted to intermesh,

said walls of said housing have tapered surfaces extending inwardly toward one another,

a washer interposed between the first gear and one of said walls,

a second washer interposed between the second gear and the other of said walls,

said washers having openings through which the input shaft extends,

each said washer having spaced wall surfaces which taper such that the washers provide parallel surfaces for engagement with the first and second gears, respectively.

4,573,367

CLOSED ROLLING NUT FOR TRANSFORMING A ROTARY MOVEMENT OF A SHAFT INTO A THRUST MOVEMENT OF THE ROLLING NUT

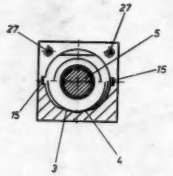
Joachim Uhing, Dorfstede 34, D-2301 Molfsee, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,563

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302633

Int. Cl.[4] F16H *21/16*

U.S. Cl. 74—99 **12 Claims**



1. A rolling nut in combination with a smooth shaft for transforming a rotary movement of the shaft into a thrust movement of the nut, comprising a tubular housing; a plurality of annular roller cages, arranged in said housing and surrounding said shaft, said roller cages being arranged in said housing at an angle to each other and to an axis of the shaft, each roller cage having an inner annular surface engageable with an outer surface portion of said shaft, each roller cage also having an outer annular surface and two side surfaces; and a plurality of distance rings arranged in said housing and respectively interpositioned between the neighboring roller cates so that they abut only against the side surfaces of the neighboring roller cages but do not surround the outer annular surfaces of the latter, said distance rings comprising means for maintaining the axial relationship of the roller cages relative to each other and to the shaft axis, a position of each of said distance rings in said housing being changeable so that the direction of inclination of each of said roller cages to the axis of the shaft can be changed and a respective roller cage can be adjusted to a desired direction of the thrust movement.

4,573,368

CARRIAGE DRIVING APPARATUS

Kazuo Kobayashi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

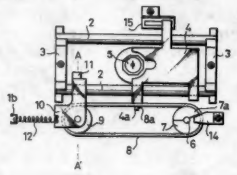
Filed Apr. 27, 1984, Ser. No. 604,960

Claims priority, application Japan, Apr. 27, 1983, 58-62136[U]

Int. Cl.[4] F16C *1/10*; F16H *21/44, 21/54, 25/18*

U.S. Cl. 74—108 **6 Claims**

1. A carriage driving apparatus comprising guide shafts extended linearly, a carriage slidably supported on said guide shafts, a pulley holder slidably and rotatably supported around one of said guide shafts at one end thereof, a driven pulley rotatably journaled at one side of said pulley holder, a drive pulley disposed at a predetermined distance from said driven pulley and connected to a rotational shaft of a driving motor, a pulling belt laid around said drive pulley and said driven pulley and connected at an intermediate portion thereof to said carriage, a base for supporting said guide shafts, and a pulley holder rotation inhibitive portion disposed on the opposite side of a mounting portion for said driven pulley with respect to the



guide shaft support portion of said pulley holder closely opposing to said base.

4,573,369

LINEAR DRIVE

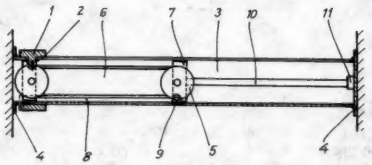
Hans Horn, Postgasse 46, 3011 Bern, Switzerland

Filed Sep. 20, 1983, Ser. No. 534,131

Claims priority, application Switzerland, Sep. 20, 1982, 5522/82; Fed. Rep. of Germany, Mar. 22, 1983, 3310304

Int. Cl.[4] F16H *21/44*

U.S. Cl. 74—110 **19 Claims**



1. A linear drive comprising:

a housing;

a linear actuator having a fixed driven rod and a liner guided for movement in a path with respect to said housing on said driven rod, said driven rod having at least one end outside to said liner fixedly connected to said housing;

a stroke ratio change transmission connected to said liner and movable with said liner along said path; and

an output member connected to said transmission and moveably mounted with respect to said housing for movement along said housing with movement of said liner along said path.

4,573,370

GEAR REVERSING MECHANISM FOR POWER TOOLS

Donald W. Clemens, Painesville, Ohio, assignor to The Rotor Tool Company, Cleveland, Ohio

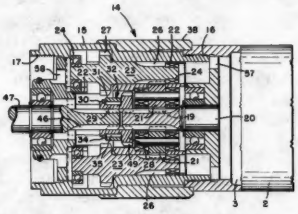
Continuation-in-part of Ser. No. 512,164, Jul. 8, 1983, abandoned. This application Dec. 30, 1983, Ser. No. 567,418

Int. Cl.[4] F16H *5/06, 3/22*; E21B *3/00*

U.S. Cl. 74—337.5 **22 Claims**

1. A gear reversal mechanism for a hand held power tool or the like, comprising a housing, a motor in said housing having a rotor pinion rotating in one direction upon motor actuation, idler gear means in mesh with and driven by said rotor pinion, transfer gear means in mesh with and driven by said idler gear means, a primary drive gear having a splined bore therein, an output drive shaft having output splines thereon, and cam means selectively to shift the primary drive gear between two alternate positions, said cam means including a shift body having ramp means thereon and the primary drive gear rotatably mounted therein for axial movement therewith, the first primary drive gear position coupling the rotor pinion to the output splines by the splined bore of the drive gear being in mesh with both to directly drive the output drive shaft in the

forward rotation mode and the second alternative drive gear position coupling the rotor pinion to the output splines via the



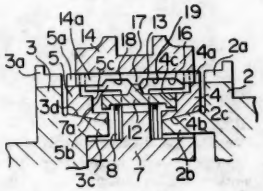
idler gear means, transfer gear means, primary drive gear and splined bore thereof to drive the output drive shaft in a reverse rotation mode.

4,573,371

AUXILIARY POWER TRANSMISSION HAVING SYNCHRONIZING MECHANISM

Hitoshi Akutagawa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 25, 1982, Ser. No. 342,587
Claims priority, application Japan, Jan. 26, 1981, 56-10597
Int. Cl.[4] F16H *3/38*; F16D *11/00*
U.S. Cl. 74—339 **8 Claims**



1. An auxiliary power transmission comprising:

axially aligned input and intermediate shafts which are rotatable with respect to each other, said intermediate shaft being connected to a main power transmission;

a first gear rotatably mounted on said input shaft and having first external teeth;

a second gear mounted on said intermediate shaft to rotate therewith and having second external teeth;

a synchronizer hub disposed between said first and second gears and mounted on said input shaft to rotate therewith, said synchronizer hub being formed with external teeth;

a synchronizer sleeve having internal teeth which are in meshing engagement with said external teeth on said synchronizer hub and axially movable to bring the internal teeth thereon into meshing engagement alternatively with said first and second external teeth on said first and second gears;

first and second synchronizer rings respectively provided between said synchronizer hub and said first and second gears, said first and second synchronizer rings being formed with external teeth adapted to mesh with said internal teeth of the synchronizer sleeve;

first friction clutch means provided between said first gear and said first synchronizer ring for synchronizing said first gear in rotation with said synchronizer sleeve when the sleeve is moved axially toward the first gear, said first friction clutch means including an external frustoconical surface coaxially formed on said first gear and an internal frustoconical surface coaxially formed on said first synchronizer ring and adapted for frictional engagement with said external frustoconical surface when said first synchronizer ring is moved toward the first gear;

second friction clutch means provided between said second gear and said second synchronizer ring for synchronizing said second gear in rotation with said synchronizer sleeve when the sleeve is moved axially toward the second gear, said second friction clutch means including an external frustoconical surface coaxially formed on said second gear and an internal frustoconical surface coaxially formed on said second synchronizer ring and adapted for frictional engagement with said external frustoconical surface of said second gear when said second synchronizer ring is axially moved toward the second gear;

said synchronizer sleeve having an axial length so that the internal teeth therein engage both the external teeth on the first and second synchronizer rings when the sleeve is out of engagement with said first and second gears;

forcing means provided between the synchronizer sleeve and the synchronizer hub for alternately forcing one of the first and second synchronizer rings toward the gear cooperating with said one synchronizer ring when the synchronizer sleeve is axially moved toward the gear cooperating with said one synchronizer ring to thereby engage the friction clutch means between said one synchronizer ring and said cooperating gear;

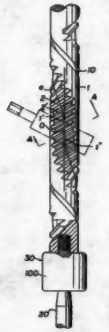
said forcing means including at least one key disposed between the synchronizer sleeve and the synchronizer hub, engagement means being provided between the synchronizer sleeve and the key so that the key is forced against one of the synchronizer rings by the sleeve as soon as the sleeve is disengaged from the gear cooperating with the other synchronizer ring; said key being formed at an intermediate portion with radially outward projection means, the synchronizer sleeve being formed with radially inward projection means adapted for engagement with said radially outward projection means on the key.

4,573,372

RACK-PINION STEERING GEAR AND METHOD FOR CUTTING RACK TEETH

Michio Abe, Aichi, Japan, assignor to Tokai TRW & Co., Ltd., Kasugai, Japan

Continuation of Ser. No. 459,124, Jan. 19, 1983, abandoned, which is a continuation of Ser. No. 106,930, Dec. 26, 1979, abandoned. This application Aug. 7, 1985, Ser. No. 763,872
Claims priority, application Japan, Dec. 27, 1978, 53-162363
Int. Cl.[4] F16H *19/04, 55/26*
U.S. Cl. 74—422 **5 Claims**



1. A rack for use in a variable ratio rack and pinion steering gear, said variable ratio rack including a longitudinally extending rack member having a straight central axis, a longitudinally extending array of rack teeth wrapped at least part way around the rack member for engaging a pinion during rotation of the

pinion and axial movement of the rack member, said array of rack teeth curving around the rack member in a first longitudinal direction from a central portion of the array of teeth to a first end portion of the array of teeth and curving around the rack member in a second longitudinal direction from the central portion of the array of teeth to a second end portion of the array of teeth, said array of rack teeth having a pitch line which curves around the rack member in the first longitudinal direction from the central portion of the array of teeth to the first end portion of the array of teeth and which curves around the rack member in the second direction from the central portion of the array of rack teeth, said array of rack teeth including teeth disposed in the central portion of the array of teeth and having a first distance between similar points on successive teeth when measured in perpendicular projection along an axis parallel to and offset from the central axis of said rack member, teeth disposed in the first end portion of the array of teeth and having a second distance between similar points on successive teeth when measured in perpendicular projection along said axis which is parallel to and offset from the central axis of said rack member, and teeth disposed in the second end portion of the array of teeth having the second distance between similar points on successive teeth when measured in perpendicular projection along said axis which is parallel to and offset from the central axis of said rack member, said second distance being different from said first distance, at least some of said rack teeth including flank surface means for interacting with the pinion to rotate the rack member and vary the amount of movement of said rack member in an axial direction under the influence of forces applied against said rack member by the pinion during equal increments of rotation of the pinion.

4,573,373

LUBRICATION SYSTEM FOR AUXILIARY EQUIPMENT TRANSMISSION

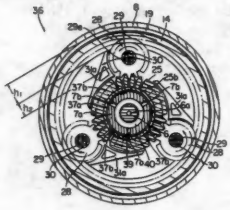
Yasuo Shimizu, and Masami Ogura, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,007

Claims priority, application Japan, Mar. 1, 1983, 58-33554; Mar. 4, 1983, 58-35556

Int. Cl.[4] F16H *57/04, 57/02;* **F01M** *9/00*

U.S. Cl. 74—468 **6 Claims**



1. A lubrication system for a planetary gear speed change mechanism having a center of rotation for aligning with an engine crankshaft and a bolt with a head for connecting to the engine crankshaft, a rotary housing with a boss portion having an inner surface and bearing and seal means, an output member including the rotary housing and having a centrifugal clutch, a clutch drum, a wrap spring, a stationary arm with a hollow shaft having bearing and seal means, an output drum, a sun gear having external teeth and a body splined to the stationary arm with bearing and seal means, a ring gear with internal teeth fitted within the rotary housing, a plurality of pinion gears with support shafts and bearing means on a pinion carrier, said pinion gears meshing between the sun gear and the ring gear, a rear cover having bearing and seal means, a one-way clutch, a lubricant reservoir at the speed change mechanism center of rotation, an input flange with bearing and seal means, and a slide plate with a boss portion fitted within the sun gear, comprising,

an annular passage providing communication between the lubricant reservoir and the head of the bolt, a notch formed in the head of the bolt providing communication between said annular passage and the rotary housing bearing, a second lubricant passage formed through the rotary housing boss providing communication between said notch and the clutch drum, passageway means providing communication between said second lubricant passage and the inner surface of the rotary housing, passageway means providing communication from the reservoir to the stationary arm bearings and lubricant seal means, passageway means along the sun gear spline providing communication from the stationary arm bearings and lubricant seal means to the pinion carrier bearing and the rear cover bearing and lubricant seal means, a lubricant passage formed through the pinion gear support shafts providing communication from the rear cover bearing and lubricant seal means to the pinion bearings and then to the one-way clutch and the inner wall of the rotary housing, lubricant guide walls formed on the pinion carrier, said guide walls being disposed substantially about the sun gear and each pinion gear, and lubricant return passages including lubricant ports in the side plate boss, an annular lubricant passage between the input member and the sun gear lubricating the sun gear bearing and seal means, a lubricant passage formed through said input member providing communication between said annular passage and the lubricant reservoir.

4,573,374

VIBRATION DAMPER ASSEMBLY

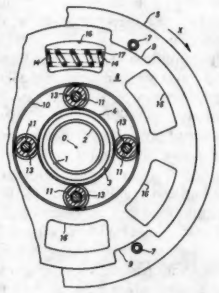
Masahiko Koshimo, Higashi-osaka, and Kiyoharu Murakami, Neyagawa, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jun. 20, 1984, Ser. No. 622,517

Claims priority, application Japan, Jun. 23, 1983, 58-114076

Int. Cl.[4] F16F *15/10;* **F16D** *47/02*

U.S. Cl. 74—574 **3 Claims**



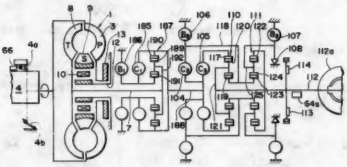
1. A vibration damper assembly including side plates fitted onto an outer periphery of a hub freely rotatably, a sun gear formed on an outer peripheral surface of the hub, a flange plate disposed outwardly from the sun gear with a space left therebetween, a ring gear facing at the sun gear being formed on an inner peripheral surface of the flange plate, and a planetary gear supported by the side plates being made mesh between the sun gear and the ring gear, the side plates and the flange plate being elastically interconnected through a torsion spring.

4,573,375

CONTROL SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLE

Hideo Hamada; Yoshiro Morimoto, both of Yokosuka; Masaaki Suga; Takashi Murasugi, both of Yokohama, and Tadashi Suzuki, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 31, 1983, Ser. No. 462,337
Claims priority, application Japan, Feb. 10, 1982, 57-18905
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—863 9 Claims



1. A control system for an automatic transmission for an automotive vehicle engine having an accelerator that actuates a throttle which opens in degrees and which is mounted within an induction pipe wherein an intake manifold vacuum develops, the transmission including a high gear ratio and a lower gear ratio, the control system comprising:

means for generating a throttle fluid pressure variable with the intake manifold vacuum;

means for generating a governor fluid pressure variable with a vehicle speed of the automotive vehicle;

means responsive to said throttle fluid pressure and said governor fluid pressure for changing the automatic transmission between the high gear ratio and the lower gear ratio;

means for generating a vehicle speed signal indicating that the vehicle speed of the automotive vehicle is lower than a predetermined vehicle speed value;

means for generating a throttle opening signal indicating that the throttle opening degree is larger than a predetermined opening degree value; and

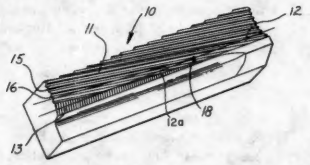
means responsive to said vehicle speed signal and said throttle opening signal for forcing the automatic transmission to downshift from the high gear ratio to the lower gear ratio.

4,573,376

METHOD OF PRODUCING THREAD ROLLING DIE

Richard H. Corrette, North Ridgeville, Ohio, assignor to Colt Industries Operating Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 366,979, Apr. 9, 1982, abandoned. This application Dec. 7, 1983, Ser. No. 558,946
Int. Cl.[4] B21K *5/20*
U.S. Cl. 76—107 R 13 Claims



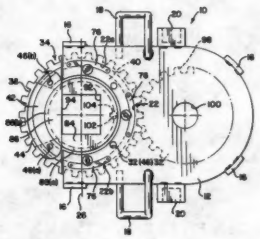
1. A method of forming a thread rolling die for fasteners and the like having cylindrical bodies and pointed ends, comprising the steps of forming a die block with a generally planar first surface corresponding to the cylindrical main body of the fastener and a second surface generally corresponding to the point of the fastener, and cutting threads across both of said surfaces, the threads on at least said second surface being cut during a plurality of separate machine passes of cutter means over said surface, the cutter means being arranged to remove sufficient material from the die block to form substantially the entire profile of the threads on said second surface whereby inaccuracies in the form of such threads on the second surface related to the original contour of the die block preform are substantially avoided.

4,573,377

LIGHTWEIGHT POWER WRENCH

John S. Sroka, 1305 Washington Ave., Parma, Ohio 44113

Filed Mar. 18, 1985, Ser. No. 712,749
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.2 13 Claims



1. A wrench for fastening, loosening, or adjusting a work piece, particularly one having both of its ends affixed, comprising a housing, a circular gear having an internal transverse opening disposed within said housing for rotation relative to said housing, gear teeth provided on the outer periphery of said gear, gear supporting means cooperating with said housing and at least one face of said gear for positioning said gear within said housing for rotation, said gear is composed of a major gear section having an arcuate extent greater than 180° and a minor gear section having on arcuate extent of less than 180°, said gear sections defining a closed circular structure in operating condition, means for removably securing said gear sections together, a removable collet means disposed within said internal opening of said gear and being supported thereby, said collet means having an interior passage of a geometric shape with an open side, means for removably securing said collet means to said gear for rotation therewith, said minor gear section being in alignment with the open side of said collet means to provide unimpeded entry of a work piece into the passage within said collet means when said minor gear section is disengaged from said major gear section, and drive means in cooperation with said gear for transmitting rotary motion to said gear.

4,573,378

MAINTENANCE TOOL FOR INACCESSIBLE WHEEL VALVES

Gerald R. McDonald, 2629 View Mount Ave., Springfield, Oreg. 97477

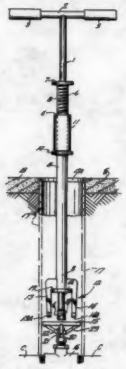
Filed Jun. 8, 1984, Ser. No. 618,920
Int. Cl.[4] B25B *19/00*
U.S. Cl. 81—463 11 Claims

1. A tool for servicing remotely disposed handle equipped valves having a packing nut, said tool comprising,

an elongate wrench member including a shaft adapted at its lower end for engagement with a valve nut securing the valve handle, and

a tubular member movably mounted on said wrench member and including valve handle engagement and retention

means at one end for inserted engagement with the valve handle, said tubular member including an impact surface



against which upwardly directed forces may be imparted during handle removal from the valve.

4,573,379

APPARATUS FOR PRODUCING AN ADJUSTING TORQUE

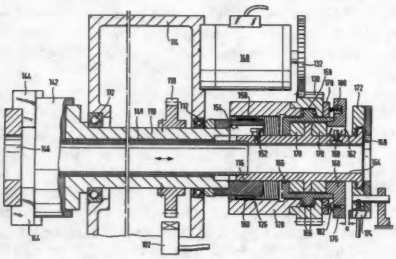
Hübert Bald, Schutzenstrasse 1, D-5920 Bad Berleburg, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,697

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218083

Int. Cl.⁴ B23B *19/00*

U.S. Cl. 82—28 R **10 Claims**



1. The combination comprising a machine having a rotatable spindle for carrying a tool or workpiece, and apparatus having a roller worm gear mechanism coaxially supported on the spindle and including a threaded input member supported for coaxial rotation with and relative to said spindle and a threaded output member supported for axial displacement along the spindle and relative to said input member and a plurality of threaded rollers disposed between and threadably engaged with said input member and said output member for axially displacing said output member along said spindle in response to rotation of said input member relative to said output member, drive means for rotating said input member relative to said output member and said spindle and including an adjusting motor having a stator mounted in fixed position on the machine and a rotor for driving said input member, clamping force storage means supported to rotate with said spindle for receiving force transmitted thereto by axial displacement of said output member relative to said input member and including an element axially displacable in response to the force received by said force storage means, means for transmitting to the tool or workpiece said force stored by said force storage means, first pick-up means for detecting the axial displacement of said element and generating an output signal relative thereto, second pick-up means for detecting the speed of rotation of said spindle relative to said rotor and generating an output signal related thereto, and a motor control circuit responsive to output signals from said pick-up means for controlling the speed of said adjusting motor.

4,573,380

APPARATUS FOR PRODUCING AN ADJUSTING ROTARY MOVEMENT

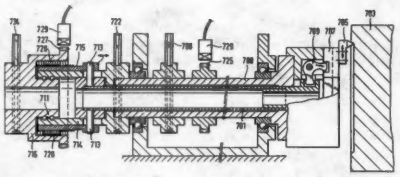
Hubert Bald, Schutzenstrasse 1, D-5920 Bad Berleburg, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,745

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218084

Int. Cl.⁴ B23B *19/00*

U.S. Cl. 82—28 R **22 Claims**



1. The combination comprising a machine having a continuously rotating spindle for carrying a tool or workpiece, and an apparatus for producing an adjusting rotary movement relative to said continuously rotating spindle, said apparatus having roller worm gear movement conversion means for converting rotary movement to axial displacement and including a supporting member carried by said spindle and coaxially rotatable therewith, a threaded input member supported by said supporting member for coaxial rotation with and relative to the supporting member, a threaded output member supported on said spindle for rotation with said spindle and axial movement along said spindle, and a plurality of threaded rollers disposed between and threadably engaged with said input member and said output member for axially displacing said output member along said spindle in response to rotation of said input member relative to said threaded output member to transmit force to a tool or workpiece carried by said spindle, a spindle drive motor, means for coupling said drive motor to said spindle to rotate said spindle, and means for adjusting the rotary movement of said movement conversion means including a superimposition drive mechanism having a synchronizing input coupled to said supporting member, a superimposition input coupled to said threaded input member, an additional output operatively connected to said superimposition input and coupled to said threaded input member, and an adjusting energy converter stationary relative to at least one of the members and operatively connected to the superimposition input.

4,573,381

BORING DEVICE

James R. Hyatt, Kinnelon, and Douglas K. Hyatt, Stratford, both of N.J., assignors to Top Tech, Inc., Butler, N.J.

Filed Feb. 24, 1984, Ser. No. 583,443

Int. Cl.⁴ B23B *29/00, 41/02*

U.S. Cl. 82—36 R **19 Claims**

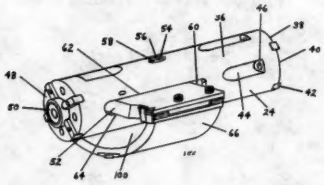
1. A boring device for use with a machine for drilling a large diametered, deep hole in a metal billet, said boring machine having a boring head with a blade slot therethrough, said device comprising in combination:

cutting insert holder means for holding a plurality of cutting inserts along the leading edge thereof, said insert holder

means being of substantially rectangular shape and dimensioned for insertion thereof through said blade slot and extending across the hole to be drilled;

blade clamp means in said boring head adapted to hold said insert holder means in the blade slot;

stabilizer means for supporting said insert holder means and for attachment to the outermost sides of said insert holder means, said stabilizer means dimensioned to conform to the wall of said hole to provide support therefor and to preclude restricting fluid flow about said insert holder means, said stabilizer means and said insert holder means together forming a D-shaped, semicylindrical body;



attachment means for attaching said stabilizer to said insert holder means; and,

a plurality of cutting inserts attached to the leading edge of said insert holder means for cutting the metal billet with overlapping cutting patterns and with at least one said cutting insert disposed on each side of said blade slot;

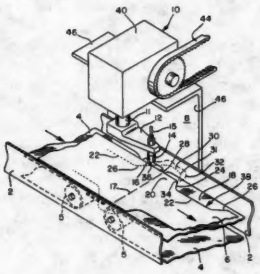
whereby an annular space for transportating a mixture of cooling fluid and metal chips is provided between said boring head, said insert holder means and the wall of the bore and between said boring head, said insert holder means and said stabilizer means.

4,573,382

APPARATUS AND METHOD FOR CUTTING A WEB

Kurt J. Kloehn, Outagamie County; Gregory J. Rajala, Winnebago County, and Kent W. Abel, Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 7, 1984, Ser. No. 607,496
Int. Cl.⁴ B26F *3/00*
U.S. Cl. 83—53 **6 Claims**



5. In a method for cutting a continuously moving web of material with a fluid jet ejected from a nozzle comprising the steps of:

moving the fluid jet in an oscillating manner from a position over a portion of the web and across a first edge location of the web to a position laterally outside the web;

moving the nozzle from said position laterally outside the web across a second edge location of the web and over the web, the movement of the fluid jet over the web cutting a section from web and the movement of the fluid jet over a plane coplanar and moving with the web laterally outside the the web defining a continuous line connecting the two edge locations of the web; and

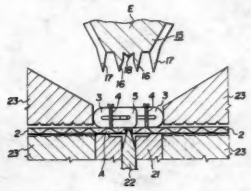
controlling the oscillating movement of the fluid jet to follow a path substantially paralle to a cutting line located laterally outward of the web and having an angular orientation between the angular orientation of first and second straight lines following the highest pitch slope of said continuous line adjacent the first and second edges, respectively, of the web.

4,573,383

APPARATUS FOR FORMING GAPS IN A SLIDE FASTENER CHAIN

Masao Matsumoto, Toyama, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 21, 1983, Ser. No. 564,026
Claims priority, application Japan, Dec. 23, 1982, 57-229233
Int. Cl.⁴ B26D *1/11*; B21D *53/50*; A41H *37/06*
U.S. Cl. 83—11 **6 Claims**



1. A punch for making spaced sections having a predetermined design into a pair of stringers in which a pair of elongated coupling elements in the form of continuous coils of synthetic resin monofilament are sewn to a pair of fastener tapes with sewing threads; said punch comprising:

a center projecting rib extending along a center line of the lower surface of a punch body and having substantially the same length as that of the spaced section to be formed;

a pair of parallel left and right inner cutting blades formed on the lower surface of the punch body, said inner cutting blades being spaced from the center projecting rib at a distance less than half off the length between the pair of sewing threads to cut the upper leg portions of the coupling elements, said inner cutting blades having a short length in a longitudinal direction to cut at least one wind of the coupling elements adjacent to one end of the spaced section; and

a pair of parallel left and right outer cutting blades formed on the lower surface of the punch body, said outer blades being spaced from the center projecting rib at a distance longer than half of the length between the pair of sewing threads to cut the connecting reversed portions of the coupling elements, said outer cutting elements having a long length in a longitudinal direction to cut the remaining winds of the coupling elements adjacent to the other end of the spaced section to be formed.

4,573,384

DICING DEVICE FOR SLICED FOOD ARTICLES

Frank W. Jones, P.O. Box 4074, Greenville, Del. 19807

Filed Aug. 1, 1984, Ser. No. 636,696
Int. Cl.⁴ B26D *3/26*
U.S. Cl. 83—404.3 **7 Claims**

1. A device for dicing a sliced food article comprising:

a base;

a slide guide means connected to the base;

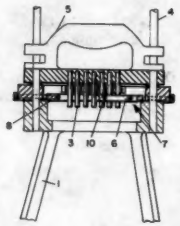
a removable rectangular shaped blade assembly with four sides, said blade assembly contains slide guide ways in which said slide guide means pass through; said blade assembly rests on said base

an upper rack of parallel spaced tensioned blades mounted

within said blade assembly and fastened to two opposing sides of said blade assembly;

a lower rack of parallel spaced tensioned blades mounted within said blade assembly in a plane parallel with the upper rack of blades and rotated ninety degrees such that said upper rack and said lower rack form a substantially rectangular shaped grid;

a plunger having slide guide ways located at the outer perimeter of the plunger in which the slide guides engage, the plunger transversing towards the base and returning along the slide guide means;



a rectangular array of fingers depending from the plunger which freely engage within the rectangular spaces between the upper and lower racks of blades when the plunger is moved towards the blades, the fingers each comprising a linear element having two ends, one end of each finger being attached to the plunger and the other end being free, the fingers being long enough to substantially pass through the lower rack of blades when the movement of the plunger into engagement with the base is terminated.

4,573,385

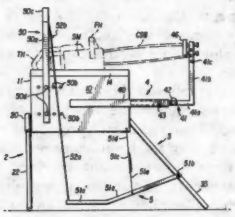
CHAIN SAW CUTTING TABLE

Berland M. Funkhouser, P.O. Box 2395, Winchester, Va. 22601

Filed Aug. 2, 1983, Ser. No. 519,671

Int. Cl.[4] B27B *27/02*

U.S. Cl. 83—788 **5 Claims**



1. A chain saw cutting table comprising a chain saw support table assembly with means to hold a saw motor portion of a chain saw immobile thereon; removable front and rear leg assemblies for said support table assembly; a chain saw bar support assembly positioned on said support table assembly said bar support assembly comprising a hollow horizontal member secured to a front panel of said table assembly and extending beyond the right side of said front panel and an L-shaped member slidably positioned within the outer portion of said horizontal member, the horizontal arm of said L-shaped member and said outer portion of said secured horizontal member each having matching means to secure them together after said L-shaped member has been properly positioned to accommodate the length of the chain saw bar of the saw secured to a top panel of said support table assembly, the vertical arm of said L-shaped member having adjustable means on its upper end to accommodate the angle the saw bar makes with the motor portion and to grip the nose end of said bar; and a cable means to activate said immobile chain saw mounted on said support table assembly and having a pivotal connection to said front leg assembly.

4,573,386

SAW CHAIN FOR A POWER-DRIVEN CHAIN SAW

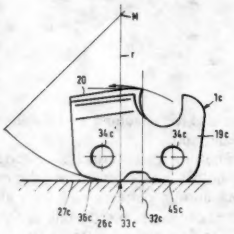
Bernd Lindemann, Schwaikheim; Götz Landwehr, Berglen-Rettersburg, and Hans-Georg Kaiser, Köngen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,352

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3235317

Int. Cl.[4] B27B *33/14*

U.S. Cl. 83—833 **22 Claims**



1. A saw chain for a power-driven chain saw having a cutter bar defining a track for accommodating and guiding the saw chain, the saw chain comprising:

a plurality of cutting links, a plurality of connecting links, and a plurality of driving links, the links being pivotally interconnected by rivets or the like to define the saw chain, each of the cutting links including:

a plate-like body having a rearward wall defining a rearward opening for accomodating one of the rivets and a forward wall defining a forward opening for accommodating an other one of the rivets, said openings defining respective linkage axes about which the cutting link pivots relative to the respective links to which it is directly connected; said linkage axes defining a plane transverse to said plate-like body;

the rearward wall having an upwardly extending bent-over top portion defining the cutting tooth of the cutting link and a downwardly extending portion defining the rearward foot of the cutting link, the cutting tooth being elongated and having a forward end defining the cutting edge thereof;

the forward wall having an unwardly extending portion defining the depth limiter of the cutting link and having a downwardly extending portion defining the forward foot of the cutting link; said cutting edge being at a first elevation with respect to the cutter bar when both of said feet are in sliding contact with the base of the track of the cutter bar;

said rearward foot having a peripheral edge extending downwardly beneath said transverse plane so as to define a single point whereat said rearward foot slidingly engages the track as the saw chain moves therealong, said point being a tilt point about which the cutting link tilts to displace said cutting edge to a second elevation above said first elevation when said cutting tooth penetrates the wood to be cut, the difference between said elevations being the tilt displacement (h) of said cutting edge,

said tilt point being formed on said rearward foot at a location thereon such that said tilt point lies between a first vertical plane passing through said rearward opening and

a second vertical plane passing through said cutting edge thereby reducing said tilt displacement to a predetermined magnitude, said first and second vertical planes being approximately perpendicular to said transverse plane.

4,573,387

KITCHEN UTENSIL FOR CUTTING OF FOOD

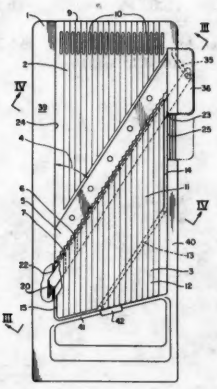
Ulrich Denter, Hambach, and Rolf-Gunter Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit AG, Nassau, Fed. Rep. of Germany

Continuation of Ser. No. 536,115, Sep. 26, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,656

Claims priority, application European Pat. Off., Sep. 27, 1982, 82108918.2

Int. Cl.[4] B26D *1/02*

U.S. Cl. 83—856 9 Claims



1. A kitchen appliance for cutting food comprising:

a frame having two oppositely situated side portions and an end portion interconnecting said side portions;

a first guide plate joined to said side portions and having an edge facing said end portion of said frame, said edge being directed at an angle of up to and including 45 degrees with one of said side portions of said frame;

cutting means extending along said edge;

a second guide plate having a first substantially rigid portion which is fixedly attached to said frame and a second substantially rigid portion positioned ajacent and spaced from said frame, said second portion having an edge region facing said edge of said first guide plate, said first portion and said second portion being hingedly joined together by hinge means, said hinge means extending substantially parallel to said cutting means; and

adjusting means connected to said edge region of said second portion and mounted on said frame for displacement relative to said frame between a plurality of positions in which it supports said edge region along the length of said edge region at different transverse offsets from said cutting means to correspondingly vary the dimension of the food being cut by said cutting means, said adjusting means being coupled to said edge region of said second portion to maintain a substantially parallel relationship of said edge region relative to said cutting means over the complete length of said edge region.

4,573,388

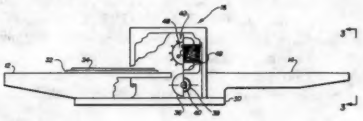
PIZZA DOCKER

Norman D. Sullivan, and Forrest E. Baker, both of Hollister, Calif., assignors to Automated Portion Control Technology, Inc., Hollister, Calif.

Filed Mar. 19, 1984, Ser. No. 590,645

Int. Cl.[4] B26F *1/24*

U.S. Cl. 83—867 2 Claims



1. Apparatus for perforating dough prior to baking, which comprises:

a tray having an upper surface thereof for supporting said dough to be perforated;

a front shelf adapted to support said tray in a horizontal condition prior to perforation of said dough;

a rear shelf adapted to support said tray in a horizontal condition and in the same horizontal plane as said front shelf, subsequent to perforation of said dough;

docker wheel means interposed between said front and rear shelves, said docker wheel means having a plurality of radially extending perforator spines which are of sufficient length to pass completely through the dough and touch said upper surface of said tray so that both tray and dough may be moved together, adjacent ones of said perforator spines being circumferentially displaced one from the other so as to form a plurality of spirals about the transverse axis of said docker wheel means, said docker wheel means including:

drive shaft means including a drive shaft which has a guide slot in the periphery thereof, said guide slot extending along the length of and in parallel with the central axis thereof;

a first docker wheel having a central aperture providing an inner surface with a diameter which is slightly larger than the outer diameter of said drive shaft, said docker wheel having an outer surface, a plurality of equally spaced perforator spines extending radially outward from said outer surface, and a key for matching engagement with said guide slot, said key being formed on said inner surface so as to be in alignment with one of said perforator spines, and

a second docker wheel having a central aperture providing an inner surface with a diameter which is slightly larger than the outer diameter of said drive shaft, said docker wheel having an outer surface, a like plurality of equally spaced perforator spines extending radially outward from said outer surface, and a key for matching engagement with said guide slot, said key being formed on said inner surface so as to be intermediate a pair of adjacent perforator spines, a number of said first and second docker wheels being alternately placed adjacent one another along the axial length of said drive shaft whereby adjacent ones of said perforator spines are circumferentially displaced one from the other;

rotatable means for supporting said tray in the horizontal plane of said front and rear shelves and disposed in the space therebetween said rotatable means including:

an idler roller having its axis transverse to the direction of motion of the tray and positioned so as to hold said upper surface of said tray firmly against the spines; and

bearing means for rotatably supporting said idler roller;

means for rotating said docker wheel means, whereby the dough is simultaneously perforated and driven passed said docker wheel means; and

means for separating said perforated dough from said perforator spines and including a housing covering said docker

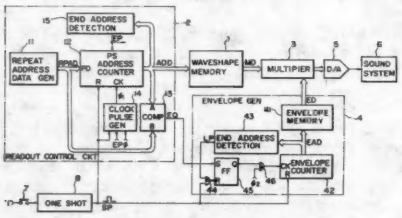
wheel means, and comb means attached to said housing, said comb means having fingers extending downwardly toward the upper surface of said back shelf so as to intersect the dough if it is lifted above said upper surface of said tray.

4,573,389

MUSICAL TONE GENERATION DEVICE OF WAVESHAPE MEMORY TYPE

Norio Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 29, 1984, Ser. No. 584,552
Claims priority, application Japan, Mar. 4, 1983, 58-36198
Int. Cl.[4] G10H *1/02, 7/00*
U.S. Cl. 84—1.26 **6 Claims**



1. A musical tone generation device of waveshape memory type for generating a musical tone waveshape which comprises rising portion correspoding to a rise-up of the waveshape and a portion succeeding to the rising portion, said device comprising:

memory means for storing first waveshape data which represent an entire part of the rising portion of a musical tone waveshape and second waveshape data which represent only a part of the portion of the waveshape succeeding to the rising portion;

readout means for reading out said first waveshape data to form the rising portion of a waveshape to be generated and for repetitively reading out said second data to form said succeeding portion of the waveshape to be generated; and

rate control means, associated with said readout means, for controlling the rate for reading out said second data from said memory means so as to establish a pitch of the generated tone waveshape at the portion succeeding to the rising portion, which pitch corresponds generally to one musical tone name, and for varying said readout rate with the lapse of time so as to to cause a corresponding variation of said pitch with passage of time.

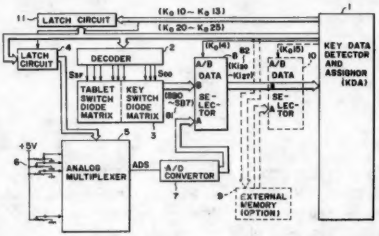
4,573,390

PLAY DATA DETECTING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENTS

Tsutomu Saito, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Continuation of Ser. No. 465,056, Feb. 9, 1983, abandoned. This application Jan. 24, 1985, Ser. No. 694,203
Claims priority, application Japan, Feb. 15, 1982, 57-22244
Int. Cl.[4] G10H *1/18*
U.S. Cl. 84—115 **2 Claims**

1. A key detect and assignor system for an electronic musical instrument which is provided with: means for sending a scan address to a key switch diode matrix or tablet switch diode matrix to obtain switch information; means for multiplexing a plurality of analog volumes; means for A/D converting the output of the multiplexing means to obtain A/D converted information; means for producing a scanning main routine housing repeating cycles; and means for selecting either one of the switch information and the A/D converted information; wherein during one cycle of the main routine, key switches of



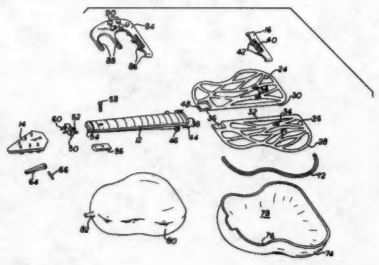
all addresses, tablet switches of only some addresses, and only one analog volume are scanned.

4,573,391

INFLATABLE KNOCK-DOWN GUITAR

Timothy P. White, 11000 Seymour Rd., Grass Lake, Mich. 49240

Filed Apr. 2, 1984, Ser. No. 595,718
Int. Cl.[4] G10D *1/08*
U.S. Cl. 84—291 **16 Claims**



1. An inflatable guitar comprising, in combination, a face panel having a periphery, an outer side and an inner side, a bridge attached to said face panel outer side, an elongated neck attached to said face panel, strings extending between said bridge and neck, a flexible bladder envelope attached to the periphery of said face panel disposed adjacent said panel inner side, and an inflatable flexible bladder within said envelope in a vibration transmitting relationship to said face panel.

4,573,392

IN-LINE BULLET FEEDER

Robert W. Mantel, Sussex, Wis., assignor to Mantel Machine Products, Inc., Menomonee Falls, Wis.

Filed Sep. 10, 1984, Ser. No. 648,719
Int. Cl.[4] F42B *11/02*
U.S. Cl. 86—43 **14 Claims**

1. In an in-line bullet feeder of the type used for seating a bullet in the open end of a shell case, said feeder including

a housing,

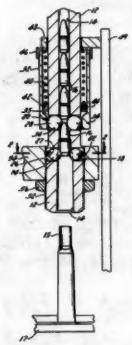
a passage through the housing, and

a gravity feed bullet reservoir connected to one end of the passage, the improvement comprising

a first ball assembly mounted in the housing in a position to prevent bullets from dropping through the passage,

a second ball assembly mounted in the housing spaced upwardly from the first ball assembly in a position to prevent bullets from moving up or down in the passage, and

cup means mounted on the housing for holding the second ball assembly in the blocking position in the passage, and means for moving said cup means away from said second



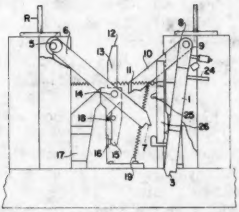
ball assembly whereby a bullet resting on said second ball assembly will cam the second ball assembly outwardly from the passage to allow the bullet to move downward to a position resting on the first ball assembly in the passage.

4,573,393

BOX DISTRIBUTOR FOR SEQUENTIALLY DISCHARGING OBJECTS FROM AIRCRAFT AND LANDCRAFT MEANS

Ludovico Fontana, Bari, Italy, assignor to Tecnovar Italiana S.p.A., Bari, Italy

Filed Jan. 31, 1984, Ser. No. 575,540
Int. Cl.[4] F41F *5/02*; B65D *7/26*
U.S. Cl. 89—1.59 **9 Claims**



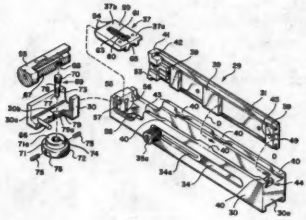
1. In a distributor for sequentially discharging objects from landcraft or aircraft means, of the type comprising a box-shaped framework with a plurality of vertical compartments, closed at the base by shutters, and control means for selectively opening said shutters; the improvement in which said distributor is a stiff box-shaped base, in which are housed said shutters and control means, two sidewalls hinged on the two longitudinal opposite edges of the base, a top wall detachably secured to the top of said sidewalls, and for transport, means for releasably retaining said top wall beneath the box-shaped base when the top wall is detached from the side walls, while the sidewalls are turned one over the other, above the upper face of said base.

4,573,394

MACHINE GUN

Charles W. Goff, 1267 West 1875 North, Farmington, Utah 84025, and Charles W. Goff, Jr., 479 Laurelwood Dr., Kaysville, Utah 84037

Filed Feb. 15, 1984, Ser. No. 580,366
Int. Cl.[4] F41D *10/24*
U.S. Cl. 89—33.01 **18 Claims**



1. A machine gun comprising, with a receiver group that includes a rectangular box shaped receiver that is stepped at a rearward top end as relating to a stock for connection to said receiver group and is open across its top and a forward end as relating to a connection to a barrel group and contains a spring biased bolt whose reciprocating travel within the receiver is initiated and stopped by operation of a trigger group fitted through a receiver undersurface, and includes a receiver top strap arranged for coupling in a covering attitude over a stepped end of said receiver open top, said top strap including means for releasably coupling said top strap in covering engagement over said receiver stepped top that consists of flange sections that extend horizontal outwardly, at spaced intervals, from opposite longitudinal sides of the top strap undersurface, and spaced apart horizontal inwardly projecting rail sections formed at intervals in longitudinal sides of the receiver stepped top to accomodate said flange sections for fitting therebetween to slide along said rail section undersurfaces as the top strap is moved longitudinally to a covering attitude, including a means for releasably maintaining the top strap in its receiver covering attitude; cartridge feed block means maintained in said receiver group adjacent to said barrel group, a throat thereof parallel to and in alignment with a juxtapositioned cartridge discharge of a magazine wherethrough cartridges are serially exhausted, the feed block means receiving each cartridge in turn through said throat for positioning it for pick-up and insertion into a barrel breech of the barrel group by reciprocating travel of said bolt that picks up each cartridge, in turn, installs and fires it in the barrel breech, and extracts the empty casing to eject it through an exhaust of said receiver; means for maintaining said cartridge feed block means to said receiver group, in exact alignment with said throat thereof juxtapositioned and opposite said magazine cartridge discharge and relative to said barrel breech for said cartridges to be cammed therefrom into said barrel breech by said bolt travel; and means, including a single screw, for aligning and securing said barrel group to said receiver group.

4,573,395

LINKLESS AMMUNITION MAGAZINE WITH SHELL BUFFER

Eugene M. Stoner, Palm City, Fla., assignor to Ares, Inc., Port Clinton, Ohio

Filed Dec. 19, 1983, Ser. No. 563,152
Int. Cl.[4] F41D *10/22*
U.S. Cl. 89—33.16 **12 Claims**

1. Linkless shell magazine apparatus for storing unfired shells to be fed to an associated gun and for storing casings of shells fired by said associated gun, said magazine comprising:

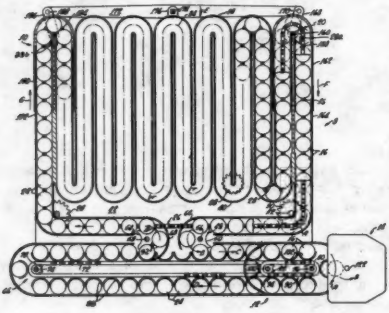
(a) a shell magazine housing having an unfired shell out-feed port and a fired shell casing in-feed port;

(b) an endless-loop, magazine shell and casing conveyor having means for holding a number of shells or casings in a serial, side-by-side relationship;

(c) conveyor guiding means mounted in said housing, said conveyor being entrained over said guiding means,

said guiding means causing the conveyor entrained thereover to follow a serpentine path through the magazine which passes by, in shell and casing transferring relationship, the shell out-feed port and the casing in-feed port;

(d) driving means connected for moving the conveyor along the conveyor path in a direction transporting shells held in the conveyor towards the shell out-feed port and transporting casings transferred into vacancies in the conveyor



through the casing in-feed port away from said in-feed port; and,

(e) shell accumulating means, responsive to a fast start up of the driving means at the initiation of firing of the associated gun, for enabling a first, short portion, relative to the entire length, of the conveyor just upstream of the shell out-feed port and a second, short portion, relative to the entire length, of the conveyor just downstream of the casing in-feed port to move in unison before other, major portions of the conveyor start moving so as to enable, upon conveyor start up, at the initiating of firing of said associated gun, temporary decoupling of said first and second short conveyor portions from said major conveyor portion.

4,573,396

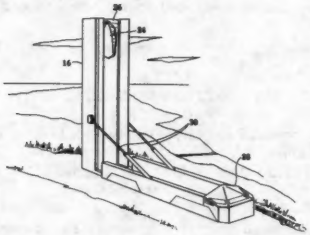
NUCLEAR BLAST HARDENED MOBILE VEHICLE

Joe W. Streetman, San Diego, and Anton K. Simson, Poway, both of Calif., assignors to General Dynamics Corporation/-Convair Div., San Diego, Calif.

Filed Jun. 17, 1983, Ser. No. 505,554

Int. Cl.[4] F41H *7/02*

U.S. Cl. 89—36.08 **11 Claims**



1. A nuclear blast hardened mobile vehicle comprising;

a chassis having a blast-resistant shell thereover;

a plurality of earth-engaging motive members on said chassis adapted to move said vehicle over the earth's surface;

drive means for causing said motive members to move said vehicle;

retraction means to retract said motive members;

skirt means extending downwardly around said shell, adapted to ride above the earth during vehicle movement and contact the earth when said motive members are retracted to substantially seal the air volume within said shell from the outside air; and

means for actively pumping air out of the chamber formed by said skirt in ground contact, the ground under the vehicle and the underside of said vehicle.

4,573,397

TURRET CONTROL SYSTEM

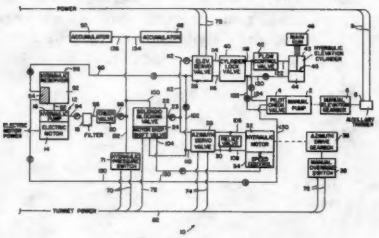
James C. LeBlanc, and Richard S. LeBlanc, both of Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 437,856, Oct. 29, 1982, abandoned.

This application Sep. 26, 1984, Ser. No. 654,712

Int. Cl.[4] F41F *21/08*

U.S. Cl. 89—41.12 **4 Claims**



1. A system for controlling the elevation of a gun on a turret comprising:

a. pressure means for providing hydraulic fluid under pressure to said system;

b. a piston-cylinder means for elevating and lowering said gun, said piston-cylinder means having a rear chamber and a front chamber;

c. said piston-cylinder means including a cylinder having a piston arranged for reciprocal movement therein, one side of said piston being connected to a piston rod which is in turn connected to said gun for elevating and lowering said gun, and the other side exposed to said rear chamber;

d. said cylinder including a first inlet for communicating fluid to said rear chamber and a second inlet for communicating fluid to said front chamber;

e. a lock valve for locking said piston in position within said cylinder;

f. said lock valve having means for permitting fluid to flow into and from said cylinder while pressurized fluid is being delivered to said lock valve by said pressure means and preventing fluid flow to and from said cylinder when said pressure means ceases to deliver fluid under pressure to said lock valve for locking the piston in place;

g. said pressure means including a hydraulic reservoir having a main reservoir at atmospheric pressure for containing fluid for use in the system and pump means for drawing fluid from said main reservoir, pressurizing said fluid, and delivering said fluid under pressure to said piston-cylinder means;

h. manual pump means for delivering fluid under pressure to said piston-cylinder means, said manual pump means requiring makeup fluid in delivering fluid under pressure to at least one chamber of said piston-cylinder means; and

i. a supercharger reservoir chamber located in said hydraulic reservoir adjacent said main reservoir for maintaining

makeup fluid under pressure greater than atmosphere for delivery to said manual pump means so as to avoid cavitation when said manual pump means is placed in operation.

4,573,398

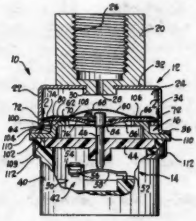
PRESSURE CONTROL DEVICE AND METHOD OF MAKING THE SAME

Carl N. Johnson; Hemant Phadke, both of Worthington, and Roger L. Sieling, Columbus, all of Ohio, assignors to Ranco Incorporated, Dublin, Ohio

Filed Nov. 5, 1984, Ser. No. 668,001

Int. Cl.[4] F16J *3/02*; F01B *19/00*

U.S. Cl. 92—101 **12 Claims**



1. A calibrated pressure responsive module constructed for hermetic connection to a pressure control device casing, the module comprising a diaphragm supported along a diaphragm center plane, a diaphragm control plate supporting said diaphragm, and a base member for connecting said plate and diaphragm to said control device casing, the pressure responsive module characterized in that:

(a) the diaphragm includes an outer marginal section hermetically joined to said plate and a central dome section snap movable from a first position on one side of said center plane to a second position on the opposite side of said center plane in response to application of a first predetermined differential pressure force to said diaphragm and snap movable from said second position to said first position in response to application of a second predetermined differential pressure force to said diaphragm;

(b) the diaphragm control plate comprises:

(i) a supporting region rigidly supporting a portion of said diaphragm surrounding said dome section along said center plane;

(ii) a first diaphragm control region hermetically bonded to said diaphragm marginal section and surrounding said supporting region, said control plate yielded and deformed between said supporting region and said control region to yieldably shift said control region relative to said supporting region and stress said diaphragm so that said dome section moves from said first position at said first predetermined pressure;

(iii) a second diaphragm control region surrounded by said supporting region and defining a diaphragm engaging face for engaging said diaphragm dome section in said second position, said control plate yieldably deformed between said supporting region and said second control region with said second control region yieldably shifted relative to said supporting region to position said dome engaging face for enabling said dome section to snap from said second position at said second predetermined differential pressure; and

(c) said base member comprises a first body portion hermetically bonded to said supporting region for rigidly positioning said supporting region with respect to said diaphragm center plane, a second body portion remote from said first body portion constructed for hermetic attachment to said control device casing, and an imperforate body wall between said first and second body portions.

4,573,399

PISTON AND CYLINDER ASSEMBLY, A POWER ASSISTED STEERING GEAR WHICH INCLUDES SUCH AN ASSEMBLY AND A METHOD OF FORMING A PISTON FOR SUCH AN ASSEMBLY

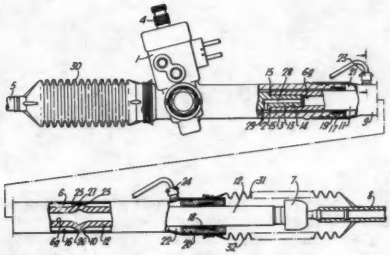
Alan G. Wilson, Bristol, United Kingdom, assignor to Cam Gears Limited, Hertfordshire, United Kingdom

Continuation of Ser. No. 504,470, Jun. 15, 1983, abandoned. This application May 9, 1985, Ser. No. 732,895

Claims priority, application United Kingdom, Jul. 21, 1982, 8221106

Int. Cl.[4] F01B *31/00*

U.S. Cl. 92—110 **10 Claims**



1. A power-assisted steering gear assembly for steering dirigible wheels comprising:

a pinion rotatable in response to a steering input;

rack means engaging said pinion and axially displaceable in response to rotation thereof;

a servomotor for assisting in displacement of said rack means, said servomotor including a cylinder and a piston member axially slidable in said cylinder;

means defining two fluid chambers located at opposite ends of said cylinder, said fluid chambers expanding and contracting upon axial displacement of said rack means;

said piston member comprising passage means therethrough for conducting fluid between said fluid chambers; and

said piston member comprising a one-piece homogeneous tubular structure, said one-piece homogeneous tubular structure including

a piston portion,

two rod portions projecting from axially opposed sides of said piston portion, said piston portion having an outside diameter greater than the outside diameter of said rod portions, the wall thickness of said piston portion being less than the wall thickness of said rod portions,

transitional surfaces extending between said piston portion and said rod portions, the diameter of said transitional surfaces progressively decreasing from said outside diameter of said piston portion to said outside diameter of said rod portions, and

surface means extending internally of said piston portion and said rod portions defining said passage means through said piston member.

4,573,400

INSULATED CHIMNEY PIPES

Martin Foy, Cridwell, England, assignor to Morganite Ceramic Fibres Limited, Merseyside, England and Insulated Chimneys (Trim) Limited, Dublin, Ireland, a part interest

Continuation of Ser. No. 215,656, Dec. 12, 1980, abandoned. This application Jul. 19, 1983, Ser. No. 514,859

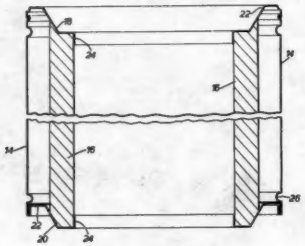
Claims priority, application United Kingdom, Apr. 16, 1980, 8012578

Int. Cl.[4] E04F *17/02*

U.S. Cl. 98—60 **8 Claims**

1. A domestic insulated chimney pipe section for use with domestic boilers, open fires or the like, said chimney pipe

section comprising an inner one-piece tubular refractory liner consisting of vacuum formed inorganically bonded aluminosilicate fibers having a density of between 100 and 600 kg/m^3, and zero effective coefficient of thermal expansion, said inner liner being exposed in use to hot and corrosive gases passing through said pipe, an outer structural metallic wall member spaced from said inner liner, and two end caps one at each end of said inner liner and outer wall member, the said two end



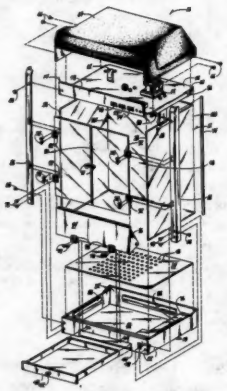
caps supporting and maintaining the said inner liner in a spaced relationship to said outer wall member so as to define therebetween an annular insulating dead air space, whereby the said inner liner and outer wall member and two end caps provide a rigid and lightweight insulated chimney pipe section, the outer wall member being protected from the heat and corrosive effects of the said gases by means of the said inner liner and its spaced relationship therefrom.

4,573,401

CORN POPPING MACHINE AND METHOD OF ASSEMBLING THE SAME

James M. Goodlaxson, 705 E. 20th St. South, Newton, Iowa 50208

Filed Apr. 18, 1983, Ser. No. 486,263
Int. Cl.^{4} A23L *1/18*
U.S. Cl. 99—323.5 **11 Claims**



1. A corn popping machine comprising:

(a) a transparent plastic one-piece panel member having first, second and third sides forming a U-shape with first and third sides integrally forming corners with opposite edges of said second side and having outer ends extending generally perpendicularly therefrom, so that said panel member is a contiguous U-shaped sheet having top and bottom edges;

(b) a top chassis plate attached to said top edge of said panel member by securing means which grasp and retentively hold said top chassis plate to said top edge of said panel member, said securing means comprising sheet metal clips of a general S-shape having a downward facing channel and an upward facing channel, said downward facing channel receiving a side of said panel member, said upward facing channel receiving a downward extending rim of said top chassis plate outwardly of and below the top edge of said panel member, said channels of said sheet metal clips containing barb means which secure said panel member and said top chassis plate in said channels upon insertion;

(c) a base member having channel members for the insertion and securing of each of said first, second and third sides along said bottom edge of said panel member, said panel providing the entire structural connection along said second side between said top chassis and said base member;

(d) each said channel member having two parallel and spaced apart walls positioned on said base so that each said side of said bottom edge of said panel member matingly fits into a said channel member;

(e) means to retentively hold each said side of said panel member into a said channel member comprising glue inserted between said panel member and said base member;

(f) door means extending across the space between said outer ends of said first and third sides in a closed position and being adjustably openable from said closed position to provide access to the interior of the enclosed chamber formed by said panel, said top chassis plate, said base member and said door means;

(g) means for making popcorn mounted to said top chassis plate inside of said chamber; and

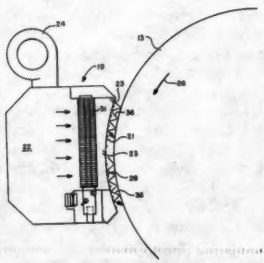
(h) each of said channels being centrally positioned on each side of said base member with the channel holding said second side of said panel member having ends terminating in spaced apart relationship to the adjacent panel sidewalls such that said glue is positioned between said second side of said panel member and said base at opposite ends of said channel holding the second side of said panel member.

4,573,402

CALIPER CONTROL SYSTEM AND METHOD

Rajeeva Sharma, 4627 Clarendon Dr., San Jose, Calif. 95129, and C. Eric Kan, 1435 Bobwhite Pl., San Jose, Calif. 95131

Continuation-in-part of Ser. No. 638,737, Aug. 8, 1984. This application Mar. 5, 1985, Ser. No. 708,345
Int. Cl.^{4} B30B *15/34, 3/04*
U.S. Cl. 100—38 **17 Claims**



1. In a system for treating a web of material: a rotating calender roll which presses against the web and varies in diameter with changes in temperature, an axially elongated cylindrical curved faceplate positioned coaxially of the roll with the front surface of the faceplate in close facing proxmity to the outer surface of the roll, a plurality of discharge openings

spaced axially along the faceplate, plenum means in fluid communication with the discharge openings, and including said faceplate as a portion thereof, blower means for delivering room temperature air under pressure to said plenum means, a sensor for monitoring the caliper of the web after it is pressed by the roll, and means responsive to the sensor for selectively controlling along a plurality of axial zones the temperature of the air passing through the discharge openings to selectively heat or cool portions of the roll to control the caliper of the web including a plurality of individually controlled electrical heating elements associated with respective zones positioned behind the faceplate for selectively heating the air passing throgh proximate discharge openings to provide air in adjacent zones having a significant temperature differential.

10. In a method of treating a web of material with a rotating calender pressure roll which varies in diameter with changes in temperature where such diameter is varied by directing air at said roll through a plurality of axially spaced openings, arranged along a plurality of zones in the axial direction in an axially elongated cylindrically curved face plate in close facing proximity to the surface of the roll and where electrical heating elements are positioned behind said faceplate in each of said zones the steps of:

providing from a single source at room temperature a continuous flow of air through said openings into the region between said faceplate and the roll; and

selectively heating in a region proximate to said faceplate by activation of said heating elements said room temperature air before it exits through the proximate opening to provide air in adjacent zones having a significant temperature differential, said continuous flow of air exiting from adjacent zones preventing spreading to confine said heated air to one said zone.

4,573,403

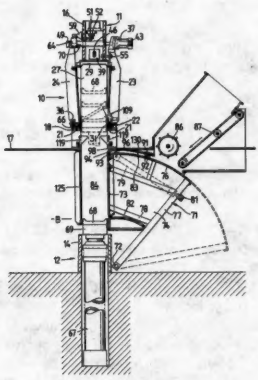
SWINGING CHARGE DOOR FOR BALER

Donald W. Van Doorn; James B. Hawkins; Francis W. Carpenter, III; Robert E. Lange, and Tommy W. Webb, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Oct. 18, 1984, Ser. No. 662,272

Int. Cl.[4] B30B *9/30*

U.S. Cl. 100—43 **23 Claims**



1. In a baler having a supporting frame and a charging box for accumulating fibrous material to be compressed into a bale by a ram mounted platen:

(a) a charge door mounted on said supporting frame to provide a closure for said charging box in a first position and to expose said charging box in a second position;

(b) means for introducing fibrous material into said charging box cooperatively positioned adjacent said charge door; and

(c) means for separating said fibrous material intermediate said charge door and said introducing means as said charge door moves from said second position to said first position wherein said separating means includes a row of spaced teeth extending outwardly and upwardly of said charge door and a plurality of spaced staggered teeth on said supporting frame in spaced relation to said charging box to mesh with said teeth on said charge door when said charge door moves between said second and first positions, with said charging door and said supporting frame having a minimum, uniform, predetermined clearance therebetween.

4,573,404

CONTINUOUS-ACTING PRESS WITH MULTI-LAYERED PRESS BANDS

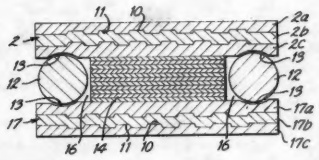
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,127

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315367

Int. Cl.[4] B30B *5/06*

U.S. Cl. 100—151 **8 Claims**



1. Continous-acting press comprising an upper and a lower multi-layered band set, a pair of return rollers for each said band set with each said band set guided over the corresponding pair of rollers, each said band set comprises a plurality of mutually contacting press bands in superposed arrangement, said upper and lower band sets being spaced apart and having mutually facing surfaces forming a space for receiving a material web therebetween such as laminate, chipboard, fiberboard, plywood, electrical laminate and the like arranged to be pressed as it passes between said mutually facing surfaces means for interengaging said materially contacting press bands, and means for sealing the laterally spaced edges of the space between the mutually facing surfaces of the upper and lower band sets which edges extend in the direction of travel of said bands over the corresponding said pair of rollers, wherein the improvement comprises that each of said press bands in each said band set has at least one first surface disposed generally parallel relative to said mutually facing surfaces and disposed in contact with another said first surface on another said press band, said means for interengaging comprises that each said first surface has alternating first grooves and lands therein extending continuously in the direction of travel of said band sets over said return rollers for the full length of said press bands, and said first grooves and lands of said contacting first surfaces being in meshed interengagement, said means for sealing comprises that each mutually facing surface of each said band set having said pair of laterally spaced edges has a second groove spaced inwardly from and extending in the same direction as each said edge so that each said groove in said mutually facing surface of said upper band set is positioned opposite one of said second grooves in said mutually facing surface of said lower band set, a wire seated within and extending between each of the oppositely disposed said second grooves in said mutually facing surfaces forming the space between said upper and lower band sets, and each said wire has a diameter equal approximately to the sum of the depths of said oppositely spaced second grooves inwardly from said mutually facing surface in which the second groove is formed and the

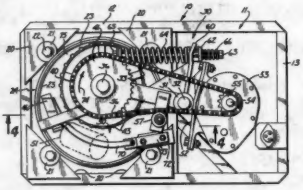
space between said mutually facing surfaces of said upper and lower band sets.

4,573,405

CAN CRUSHING MACHINE

Ruben D. Morlock, Western Park Village, Jamestown, N. Dak. 58401

Filed Jul. 19, 1984, Ser. No. 632,598
Int. Cl.[4] B30B *9/32*
U.S. Cl. 100—157 **11 Claims**



1. A machine for crushing cans comprising:

a support;

tubular drum means having an inner wall surface and being rotatably mounted on the support;

roller means having an outer surface;

means to mount the roller means on the interior of the tubular drum means with its outer surface in engagement with the inner wall surface of the drum means;

said means to mount including a support arm pivotally mounted on said support at a first end and the roller being rotatably mounted on the second end of said arm about an axis parallel to the axis of the tubular drum;

means for resiliently urging the outer surface of the roller means into engagement with the inner wall surface of the drum means without causing excessive wear on the outer surface of the roller means or the inner wall surface of the drum means and at an increased spring rate after the roller has moved away from the drum wall a selected distance; and

a drive motor mounted to be movable with the support arm about the axis for driving said roller to crush cans introduced into the drum between the roller and inner wall surface of the drum.

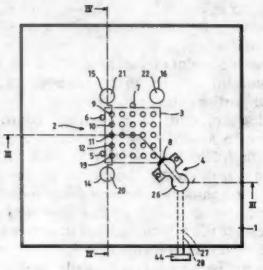
4,573,406

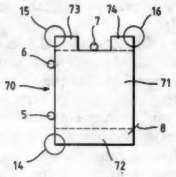
SCREEN PRINTING DEVICE

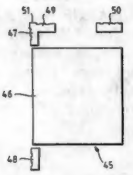
Camiel D. E. Cleemput, Wondelgem-Gent, and Hedwig L. Z. Coussement, Nevele, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,847
Claims priority, application Belgium, Oct. 6, 1983, 60222
Int. Cl.[4] B41L *13/02, 13/12;* **B41F** *15/36*
U.S. Cl. 101—127.1 **17 Claims**

1. Screen printing device including a work table having a printing position, means on said work table for holding a substrate in said printing position, a holder for a screen provided with a mask, said mask having reference portions, a microscope, and means for adjusting the relative positions of said table, said screen holder and said microscope, wherein it further includes a template with reference portions corresponding to said reference portions of said mask (**45**), said work table (**1**) having at least one hole with associated illumination means to simultaneously illuminate said corresponding reference portions of said mask and of said template held in said printing position by said holding means in order to be able to adjust, with the help of said adjustment means, the relative position of







said reference portions of said template and said reference portions of said mask when viewed through said microscope.

4,573,407

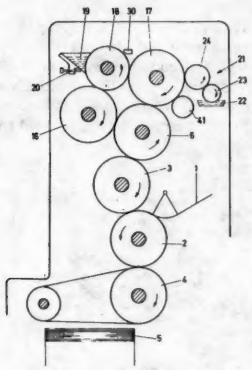
INKING MECHANISM FOR OFFSET PRINTING MACHINES

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,741
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1981, 3143314; Sep. 3, 1982, 3232780
Int. Cl.[4] B41F *7/26, 31/00;* **B41L** *25/14*
U.S. Cl. 101—148 **5 Claims**

1. Inking unit for an offset printing machine with a plate cylinder comprising at most two ink applicator rolls with an elastic surface cooperatively engaging the plate cylinder for delivering ink to the plate cylinder, an ink feeding system and an inking cylinder cooperating with said ink feeding system for receiving ink therefrom and cooperatively engaging said ink applicator rolls so as to feed the ink in a continuous film thereto, said ink applicator rolls having a diameter approximately equal to the diameter of the plate cylinder and being located downstream from said inking cylinder in ink feeding direction, said ink applicator rolls being rotatable in a given direction, the sum of an arc length on the periphery of the plate cylinder, as seen in direction of rotation of the plate cylinder, from a location at which the plate cylinder is in engagement

with a first one of said ink applicator rolls to a location at which the plate cylinder is in engagement with the second one of said ink applicator rolls, an arc length on the periphery of said second ink applicator roll, as seen in direction of rotation of said second ink applicator roll, from said last-mentioned location to a location at which said second ink applicator roll is in engagement with said inking cylinder, and an arc length on the periphery of said inking cylinder, as seen in direction of rotation of said inking cylinder, from said engagement location of said second ink applicator roll and said inking cylinder to the mutual engagement location of said inking cylinder and said first ink applicator roll being equal to an arc length on the



periphery of said first ink applicator roll, as seen in direction of rotation of said first ink applicator roll, from said location at which the plate cylinder is in engagement with said first ink applicator roll to said location at which said first ink applicator roll is in engagement with said inking cylinder, plus the circumferential length of one of said first and said second ink applicator rolls, and means for transfering dampening medium to said first ink applicator roll in said direction of rotation of said first ink applicator roll at a location downstream of said location at which said first applicator roll is in engagement with said inking cylinder and upstream of said location at which said first ink applicator roll is in engagement with the plate cylinder.

4,573,408

ADJUSTMENT ARRANGEMENT FOR CIRCUMFERENTIAL REGISTER IN ROTARY PRINTING MACHINES

Wilhelm Bezler, Augsburg, and Ewald Stark, Fischach, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,825

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 3405455

Int. Cl.[4] B41F *13/14*

U.S. Cl. 101—248 **10 Claims**

1. In a rotary printing machine having a cylinder;

a plurality of meshing gears (1, 2, 3, 5) forming a gear train (1–3, 5) driving said cylinder, said meshing gears including a first driven gear (1) and a second gear (2) coupled in angularly fixed relation to said cylinder;

register adjustment apparatus for circumferential adjustment of the angular relation of the cylinder with respect to said first driven gear (1) by shifting the angular relationship between the first gear (1) and the second gear (2) comprising, in accordance with the invention

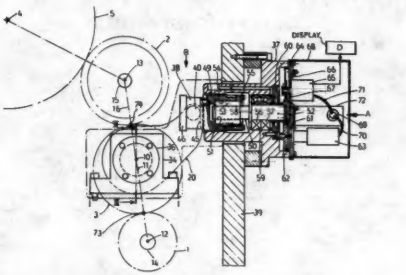
a third gear (3) drivingly connected between the first gear (1) and the second gear (2);

a shaft element (9, 6) having a central axis (10), said shaft element having an eccentric portion (6) which has an eccentric axis (11), eccentrically positioned with respect to said central axis, said third gear being journalled on said eccentric portion (6);

the central axis and the centers of rotation (12, 13) of the first and second gears (1, 2) being positioned on a theoretical plane (16),

and wherein, when the eccentric axis (11) defining the center of the eccentric portion (6) is also on said plane, the eccentric portion is defined to be in a normal position;

and operating means (20; 38, 40–48, 50–63) coupled to the shaft element (9, 6) for effecting an adjusting movement



by rocking the shaft element about the central axis (10) and thereby shifting the eccentric axis (11) out of said normal position, while maintaining meshing engagement between the first and third gears (1, 3) and the second and third gears (2, 3), respectively, and thereby rotation transmission between the first and second gears (1, 2) while shifting the engagement point (73) of the third gear (3) with the pitch circle of the first gear (1) away from said central axis (10) and further shifting the engagement point (74) of the third gear (3) with the pitch circle of the second gear (2) closer to said central axis (10), thereby causing an angular shift of the second gear (2) with respect to the first gear.

4,573,409

METHOD OF TREATING PRINTED COMPUTER PAPER

Milton Clar, Bethesda, and Barclay Booth, Potomac, both of Md., assignors to Paper, Inc., Gaithersburg, Md.

Filed Dec. 2, 1982, Ser. No. 446,336

Int. Cl.[4] B42D *15/00*

U.S. Cl. 101—426 **3 Claims**

1. A method of reusing a web of computer paper having a series of interconnected sheets, eah computer-printed on only one surface with character-based information and having the opposite surface free of printing, comprising drawing the web continuously past a rotary printing cylinder having a printing plate formed over substantially its entire printing suirface with a character-based interference printing pattern, characters of the interference printing pattern being the same as or similar to characters of the information, and using said plate to print said pattern over substantially the entire printing area of said one surface of each sheet without reference to the location thereon of the information, the composition and density of the pattern being surfficient to obliterate the information, whereby the opposite surface of each sheet may be used for subsequent printing without permitting access to said information, and

thereafter computer-printing on said opposite surface of the sheet.

4,573,410

PRINTING PRESS WITH REGISTER MOTORS

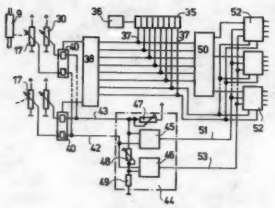
Udo Blasius, Leimen; Karl-Heinz May, Viernheim, and Anton Rodi, Leimen, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 604,408, Apr. 27, 1984, abandoned, which is a continuation of Ser. No. 362,442, Mar. 26, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 675,457

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112189

Int. Cl.[4] B41F *31/04*; B41L *27/06*

U.S. Cl. 101—365 **16 Claims**



1. A printing press comprising a plurality of individually and simultaneously operable setting motors, each setting motor being connected to a pick-up generating electric signals characteristic of an actual position of the respective setting motor at any given moment and representing a given actual value, comprising an electronic comparator device having means for receiving respective actual values supplied thereto and means for receiving desired values for the position of the respective setting motors, said electronic comparator device having means for repeatedly scanning the actual values in a cyclical time sequence for comparing the actual values with the respective desired values to form setting signals for simultaneously operating the respective setting motors in the forward and reverse direction when a given positive and negative minimum deviation, respectively, is exceeded, as well as setting signals for stopping said setting motors, and a switching arrangement having means for receiving said setting signals, respectively, and , in response thereto, for driving the respective setting motors simultaneously, at a predetermined speed, in said forward and reverse direction, respectively, determined by a last preceding setting signal until a next succeeding setting signal relating to the respective motors is received, and for stopping the respective setting motors, respectively.

4,573,411

SAFETY DEVICE FOR A WEAPON DETONATOR OR FUSE

Josef Liebhardt, Schrobenhausen, and Rudolf Fuhrer, Baar, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

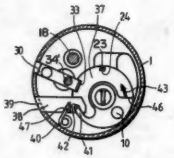
Filed May 29, 1984, Ser. No. 614,833

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321191

Int. Cl.[4] F42C *15/34*

U.S. Cl. 102—256 **5 Claims**

1. A safety device for a fuse or detonator for a weapon, comprising housing means, a detonator chain including a plurality of detonator elements arranged in series, means for rotating one detonator element **(10)** out of and into said detonator chain for respectively disarming or arming the fuse or detonator, said means for tilting comprising a rotor member **(3)** operatively supported in said housing means and carrying said one detonator element for rotation between a disarmed position and an armed position, rotor arresting means cooperating with said rotor member for arresting said rotor member in the disarmed position, said rotor member comprising a first locking recess **(24)** and a second locking recess **(33)**, said rotor arresting means comprising a first arresting member **(23)**, a spring biased lever **(22)** journalled in said housing means and operatively connected to said first arresting member **(23)** for arresting said rotor in said disarmed position when said first arresting member **(23)** is engaged in said first locking recess **(24)**, whereby said spring biased lever is held in a locking position by its spring bias, said rotor arresting means further comprising a second arresting member **(30)** operatively engaging said second locking recess **(33)** also for arresting said rotor in said disarmed position, a push rod **(34)** operatively arranged for cooperation with said second arresting member **(30)**, and electrically operable tripping means **(29)** operatively arranged for operating said push rod for removing said second arresting member out of its rotor arresting position, said rotor member



(3) having a stop shoulder **(46)**, said safety device further comprising a spring biased stop element **(38)** operatively mounted in said housing means for providing a stop for said stop shoulder **(46)** when said rotor is in said arming position, an opening **(39)** in said housing means for passing said spring biased stop element **(38)**, when said fuse or detonator is outside a weapon, at least partially out of said housing means and out of the way of said stop shoulder **(46)**, whereby said rotor can move past the armed position back into the disarmed position while said fuse or detonator is outside a weapon, said spring biased stop element **(38)** comprising means for blocking said stop element **(38)** against movement back into said housing once the stop element sticks out of said housing means, said device further comprising interengaging means **(41, 42)** between said stop element **(38)** and said rotor member **(3)** for holding said stop element inside said housing means against its spring bias as long as said one detonator element **(10)** is in its disarmed position, whereby said fuse or detonator can be effectively armed only inside a weapon.

4,573,412

PLUG NOZZLE KINETIC ENERGY PENETRATOR ROCKET

Donald E. Lovelace; Michael C. Schexnayder, and George W. Snyder, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1984, Ser. No. 604,772

Int. Cl.[4] F42B *15/10, 11/00*

U.S. Cl. 102—374 **4 Claims**

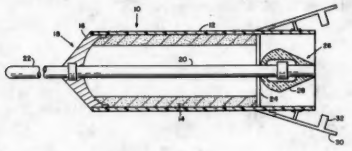
1. A plug nozzle kinetic penetrator rocket comprising:

a. a rocket motor casing having a forward closure member secured thereto;

b. a kinetic energy penetrator rod having a forward end supported by and extending through said closure member;

c. a plurality of struts secured in spaced relation to an aft end

of said penetrator rod for supporting said penetrator rod along the longitudinal axis of acid rod; and



d. insulating means disposed around the aft end of said penetrator rod to prevent erosion thereof said insulating means forming a plug nozzle with said motor casing. pg,7

4,573,413

MONORAIL TRANSPORT SYSTEM

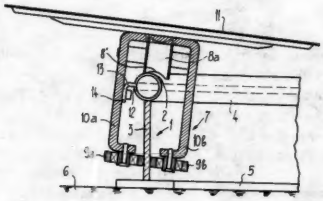
Jürg Eberle, Hinwil, Switzerland, assignor to Feramatic AG, Hinwil, Switzerland

Filed May 18, 1983, Ser. No. 495,773

Claims priority, application Switzerland, May 25, 1982, 3202/82

Int. Cl.⁴ B61B *13/06*

U.S. Cl. 104—120 **6 Claims**



1. A transport system comprising:

rail means including curved portions and containing a supporting surface;

at least one drivable undercarriage provided with two running wheels arranged substantially along a lonitudinal axis of said undercarriage;

a pair of guiding rollers provided for said undercarriage and arranged in a central region of and intermediate said running wheels;

said pair of running wheels and said pair of guiding rollers being rigidly interconnected by means of said undercarriage in order to permit said drivable undercarriage to assume an inclinded position during travel through said curved portions of the rail means;

each of said running wheels having a curved bearing surface;

said supporting surface of said rail means being curved substantially complementary to said curved bearing surfaces of said running wheels and coacting therewith;

a guiding web cooperating with said rail means and extending between said pair of guiding rollers beneath said supporting surface of said rail means;

each one of said guiding rollers and said pair of running wheels are rigidly arranged in a predetermined substantially triangular configuration;

a support for receiving material to be transported;

said support being secured to said undercarriage;

each one of said guiding rollers being arranged sufficiently close to said pair of running wheels in said predetermined substantially triangular configuration to ensure for an adequately inclined position of said drivable undercarriage during travel through said curved portions of the rail means so that any material received and transported on said support is not moved away from said support during travel of said drivable undercarriage through said curved portions of the rail means.

4,573,414

DEVICE FOR FIXING A TELPHER CHAIR TO A CABLE PROVIDED WITH A TRAVELLING SURFACE FOR ROLLERS

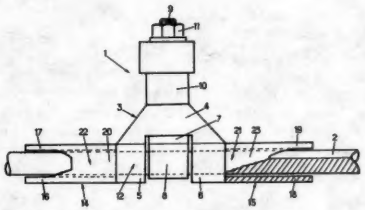
Michel Cantin, Pariset; Pierre Jaussaud, Biviers, and Roger Olivella, Saint Egreve, all of France, assignors to Institut National Polytechnique de Grenoble, Grenoble, France

Filed Jul. 20, 1984, Ser. No. 632,751

Claims priority, application France, Jul. 21, 1983, 83 12098

Int. Cl.⁴ B61B *12/12*

U.S. Cl. 104—202 **10 Claims**



1. A device for fixing a telpher chair or a telpher car to a cable, on which grooved rollers have to pass, comprising:

a clamp connecting the telpher chair or car to the cable and defining a first travelling surface for the rollers and a U-shaped recess for receiving the cable,

opposing extensions, being connected to the opposing ends of the clamp, for defining second travelling surfaces on either side of the first travelling surface, each of said opposing extensions including at least one arm extending laterally relative to the cable and along the same side of the cable, said second travelling surfaces each having a ramp portion defined by said arms, whereby the rollers, rolling over the cable and passing over the clamp, tangentially contact one of said second travelling surfaces at one of said ramps, and thereby leave the cable tangentially, the roller travelling on said second travelling surface away from the cable and contacting the first travelling surface, the roller reaching the end of the first travelling surface and said opposing second travelling surface, then travelling on said opposing second travelling surface toward the cable and tangentially leaving said opposing second travelling surface and returning to tangential contact with the cable at said ramp corresponding to said opposing second travelling surface wherein said ramps are concave.

4,573,415

STAND WITH SPRING LOCK LEGS

Edwin O. Ramey, Fort Lauderdale, Fla., assignor to Atlas Metal Industries, Inc., Miami, Fla.

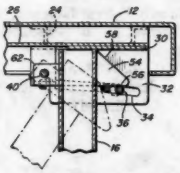
Filed Jul. 6, 1984, Ser. No. 629,187

Int. Cl.⁴ A47B *3/00*

U.S. Cl. 108—129 **11 Claims**

1. A supporting structure comprising a support panel, at least one support leg assembly, and means connecting said leg assembly to said panel in perpendicular depending relation thereto to support the support panel in elevated relation to a support surface, said connecting means including a bracket fixedly attached to said support panel, said bracket including a downwardly opening socket, said leg assembly including an upper end received in said socket and including a latch structure at one edge portion thereof and means at the opposite edge portion engaged with said bracket, said bracket including a spring-biased member slidably mounted thereon for permitting the latch structure to pass upwardly into the socket by out-

ward movement of the spring-biased member, said spring-biased member snapping back into underlying relation to the latch structure to retain the leg assembly in perpendicular relation to the support panel, said latch structure including an inclined cam surface on the upper end thereof for camming said spring-biased member outwardly when the latch structure



moves into the socket, said bracket including spaced parallel plates forming a portion of the socket, each of said plates including an upwardly and inwardly inclined slot, said spring-biased member including a rod having end portions slidable in the slots, and tension coil springs interconnecting the rod and plates to bias the rod inwardly in the slots to continuously bias the latch structure upwardly in relation to the socket.

4,573,416

AFTER HOUR DEPOSITORY

Hiroshi Masachika, Hiroshima, Japan, assignor to Kumihara Safe Co., Inc., Japan

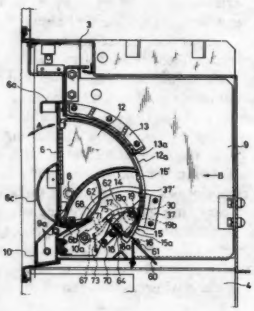
Filed Feb. 24, 1983, Ser. No. 469,311

Claims priority, application Japan, Oct. 2, 1982, 57-172538

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] E05G *1/026*

U.S. Cl. 109—66 **25 Claims**



1. An after hour depository comprising a door casing having inside walls and adapted to be fitted into a framework in a building so as to be pivotal between open and closed positions about a shaft horizontally extending across both side walls of the framework, movable wall means disposed in operative association with the door casing for developing a pocket into which a bag or an envelope containing money to be deposited is placed, a rotary stopper fixedly secured to the lower part of the door casing to define said closed position, a sleeve roller disposed rotatably about a roller shaft horizontally extending across both the side walls of the door casing and displaceable together with the movable wall, ratch means for guiding and defining the movement of the sleeve roller, said ratch means being pivotally secured to the side wall of the framework, a sliding member fixedly secured to the side wall of the framework so as to allow the movable wall to be pivoted in such a direction to eliminate the pocket in cooperation with the sleeve roller, and protection means for protecting against criminal activity, said protection means including means defining at least one arcuate groove on the inside walls of the door casing, said arcuate groove having a center of curvature coincident with the pivotal axis of the movable wall and pins projecting from side faces of the movable wall and operatively fitted into the arcuate grooves.

4,573,417

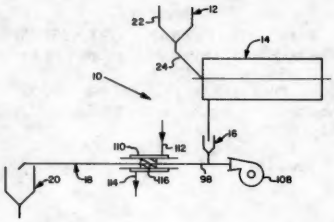
SAND RECLAMATION SYSTEM EMBODYING A COMBINATION THERMAL RECLAIMER AND SAND-TO-SAND HEAT EXCHANGER APPARATUS

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 30, 1984, Ser. No. 605,086

Int. Cl.[4] F23D *14/00*; F23G *5/00, 5/12*

U.S. Cl. 110—236 **11 Claims**



1. A system for treating solid, granular and aggregate material thermally comprising:

a. material supply means containing a supply of material to be thermally treated;

b. combination thermal reclaimer and heat exchanger means connected in fluid flow relation to said material supply means for receiving material therefrom, said combination thermal reclaimer and heat exchanger means including a multi-chamber rotating unit having inlet means operative as an entrance into said multi-chamber rotating unit for material received from said material supply means, a preheat chamber connected in fluid flow relation with said inlet means for receiving material therefrom and operative to cause material passing therethrough in a first direction to be preheated from a first temperature to a second temperature, an inner tube connected in fluid flow relation with said preheat chamber for receiving preheated material therefrom, said inner tube having burner means cooperatively associated therewith operative for heating material passing through said inner tube in a second direction to a third temperature to thermally treat the material, chamber means connected in fluid flow relation to said inner tube for receiving thermally treated material therefrom and operative for further treating material passing therethrough, and outlet means operative for discharging therethrough treated material from said multi-chamber rotating unit;

c. feeder means connected in fluid flow relation with said combination thermal reclaimer and heat exchanger means for receiving thermally treated material therefrom, said feeder means being operative for effectuating the feeding of material in a dispersed manner;

d. cooling and transporting means cooperatively associated with said feeder means for receiving material being fed therefrom, said cooling and transporting means being operative to cool the material received thereby to a predetermined temperature as the material is being transported therethrough; and

e. material receiving means connected in fluid flow relation with said cooling and transporting means for receiving material at said predetermined temperature therefrom.

4,573,418
METHOD OF AND APPARATUS FOR REHEATING DESULFURIZED WASTE GAS

Hans Märzendorfer, Graz, and Werner Schaller, Autal, both of Austria, assignors to Steirische Wasserkraft- und Elektrizitaets-AG, Graz, Austria

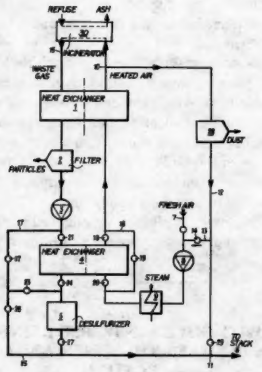
PCT No. PCT/AT83/00015, § 371 Date Aug. 1, 1984, § 102(e) Date Aug. 1, 1984, PCT Pub. No. WO84/02174, PCT Pub. Date Jun. 7, 1984

PCT Filed May 30, 1983, Ser. No. 642,661

Claims priority, application Austria, Dec. 1, 1982, 4368/82; Mar. 4, 1983, 767/83; Mar. 17, 1983, 948/83

Int. Cl.⁴ F23J *11/00*

U.S. Cl. 110—345 **14 Claims**



1. In an incineration process where refuse is burned in an incinerator in the presence of air to produce a hot sulfur- and particle-containing waste gas, the treatment method comprising the steps of:

preheating air with the hot waste gas;

passing the hot waste gas through one side of a heat exchanger;

passing air through the other side of the heat exchanger and thereby heating the air and cooling the waste gas;

desulfurizing the cooled waste gas;

feeding at most a portion of the heated air to the incinerator and there using it to combust the refuse;

mixing another portion of the heated air with the cool desulfurized gas; and

releasing the mixture of cool desulfurized gas and the other portion of the heated air to the atmosphere.

4,573,419
DEVICE FOR THREADING KNIT ARTICLES ONTO THE PIN HOLDER RING OF A LINKING MACHINE

Alessandro Peloggio, Brignano Gera D'Adda, Italy, assignor to Exacta S.p.A., Brignano Gera D'Adda, Italy

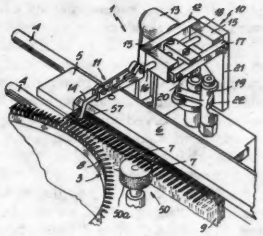
Filed Jan. 13, 1984, Ser. No. 570,554

Claims priority, application Italy, Jan. 27, 1983, 19305 A/83

Int. Cl.⁴ D05B *7/00*

U.S. Cl. 112—27 **8 Claims**

1. A device for threading knit articles onto the pin holder ring of a linking machine, comprising, in a supporting frame associated with said linking machine, a carriage sliding along a runway rigid with said frame and extending in a substantially tangential direction to said pin holder ring, a comb-like element being motion-wise rigid with said carriage and having a plurality of coplanar dents facing said pins, a transfer assembly cooperating with said dents, a means for kinematically and selectively connecting said carriage to said pin holder ring or to an auxiliary drive means, thereby said carriage, when kinematically connected to said pin holder ring, has a translation speed substantially equal to the peripheral speed of rotation of said pin holder ring during a knit article threading stroke, and a means for picking up one of said knit articles threaded onto



said comb-like element to pre-arrange it into an advanced position on said dents.

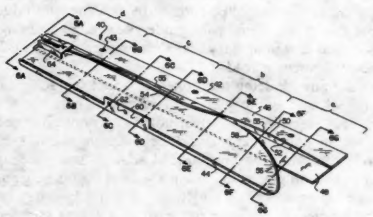
4,573,420
APPARATUS FOR PRODUCING SIMULATED FELLED SEAM

Charles F. Carson, 2503 Lakeshore Dr., Greensboro, N.C. 27407

Filed Mar. 18, 1985, Ser. No. 713,181

Int. Cl.⁴ D05B *35/02*

U.S. Cl. 112—142 **6 Claims**



1. Apparatus for folding and seaming a pair of fabric members into a finished three-ply construction in which said fabric members have proximate abutting margins, the adjacent edges of which are united by a row of basting stitches, and in which one of the fabric members is folded along a first imaginary line on one side of said row of basting stitches to underlie the united margins and the other of the fabric members is reverse folded along a second imaginary line on the other side of said row of basting stitches to overlie the united margins, and further in which the three-ply seam is subsequently stitched together, said apparatus comprising:

(a) a folding station having an upstream end and a downstream end;

(b) a first joining means adjacent the upstream end of said folding station for initially joining the abutting edges of said pair of fabric members to preliminarily hold them in abutting relationship during the folding operation;

(c) a second seaming means adjacent the downstream end of said folding station for permanently joining all three plies;

(d) feed means for transporting said basted pair of fabric members from said first seaming means to said second seaming means through said folding station along a feed path substantially parallel with the line formed by said abutting edges;

(e) said folding station comprising:

(i) a base plate having a guide rib or scroll extending upwardly therefrom and a guide plate spaced above said base plate a distance at least as great as the thickness of the fabric member being processed;

(ii) said guide plate including a longitudinal edge thereof extending lengthwise of said folding station and forming

the aforesaid first imaginary line around which said underlying fabric member is folded;

(iii) said guide rib being positioned adjacent said longitudinal edge of said guide plate and having a first upstanding curved edge means that is so constructed as to extend in a convolute path as to lift the united margins and the overlying fabric member up and around the longitudinal edge of said guide plate, and a second guide rib having a second upstanding curved edge downstream of said first curved edge that extends in a convolute path and forms said second imaginary line around which said overlying fabric member is reverse folded to overlie the united margins.

4. A device for folding a pair of abutting fabric members having proximately abutting margins, the adjacent edges of which are united, into a folded, three-ply construction in preparation for a finished seaming operation in which one of the fabric members is folded along a first imaginary line on one side of the abutting edges to underlie the abutting margins and the other of the fabric members is reverse folded along a second imaginary line on the other side of said row of said basting stitches to overlie the abutting margins, said device comprising:

(a) a base plate having a guide rib extending generally upwardly therefrom and a generally horizontal guide plate spaced above the surface of said base plate a distance at least as great as the thickness of one of said fabric members;

(b) said guide plate including one longitudinal edge extending lengthwise of said base plate along a feed path generally parallel with a line formed by the abutting edges of said fabric members, said guide plate edge forming the aforesaid first imaginary line about which said underlying fabric member is folded;

(c) said guide rib being positioned adjacent said longitudinal edge of said guide plate and having a first upstanding curved edge that is so constructed in a convolute path as to lift the united margins and the overlying fabric member up and around the longitudinal edge of said guide plate and a second guide rib having a second upstanding curved edge downstream of said first curved edge that is also constructed in a convolute path that forms said second imaginary line around which said overlying fabric member is reverse folded to overlie the united margins.

4,573,421

SEWING MACHINE DEVICE FOR MAKING GARMENTS WITH PLEATS

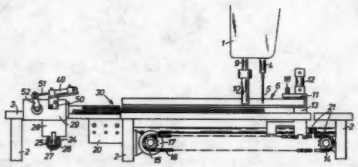
Günther Mall; Herbert Dietrich, and Willi Stephan, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,009

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 8430596

Int. Cl.[4] D05B *35/08*

U.S. Cl. 112—146 **12 Claims**



1. In an apparatus including a sewing machine having a stitch forming point for making garments with preformed pleats which comprise two oppositely directed fold parts lying under a continuous center part with respective crease edges and the juncture of the center and fold parts and having fold edges at the ends of the fold parts, and which have continguous fold edges which are sewn together over a predetermined length to form inverted pleats, and in which after a pleat has been correctly positioned on a pleating bar movable between a charging position and a transfer position which determines the position of a seam and which also includes a feed presser strip engageable with the garment in the area to be sewn and which is movable to transport to garment through the stitch forming point of the sewing machine, comprising a pleating bar having a width equal to substantially the half width of the center portion of said inverted pleat and having a contact edge for the inverted pleat in the direct field of vision of an operator, said bar having fixing pin cutouts, a needle bar having a plurality of needle bar fixing pins movable relative to said pleating bar for the aligned inverted pleat, and having fixing pins engageable in respective cutouts, the displacement paths of said pleating bar and said needle bar between a charging and a transfer position being predetermined.

8. A device for use with a sewing machine for making garments with pleats using a folded over workpiece material between the folds of which the device is insertable, comprising a support member, a pleating bar assembly carried by said support member being insertable with a portion of said support member between the folds of the material and including at least two movable plate members, actuator means carried by said support member to move said plate member from an expanded position for receiving a pleat to a collapsed position and drive means for moving said support for positioning it in respect to the workpiece.

4,573,422

SHIP WITHOUT TRANSVERSE REINFORCING MEMBERS BETWEEN THE INNER AND OUTER HULL PLATING

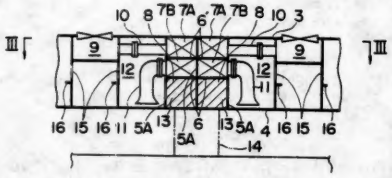
Seiichiro Murata; Masaru Tateishi, both of Sakai; Kohji Hayakawa, Nishinomiya; Takeshi Sakamoto, Suita; Shin Takeuchi, and Kohsuke Mukasa, both of Arao, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jul. 6, 1984, Ser. No. 628,467

Claims priority, application Japan, Jul. 11, 1983, 58-107853[U]

Int. Cl.[4] B63B *3/62*

U.S. Cl. 114—65 R **4 Claims**



1. A ship having at least its side portions and bottom portion comprised of a double hull construction comprising an inner hull plating and an outer hull plating connected together by transverse bulkheads and a plurality of connecting longitudinal members fixed to the transverse bulkheads, the bottom portion of the ship having a space defined by at least two adjacent connecting longitudinal members, characterized in that

(a) there are no reinforcing transverse members, other than said transverse bulkheads, intersecting said connecting longitudinal members, and

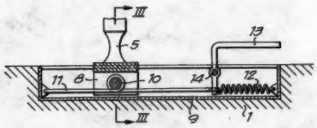
(b) said space is divided by a horizontal partition into upper chamber means and a lower chamber, said upper chamber means being adapted in its entirety to pass at least one fluid therethrough, said lower chamber being provided with docking brackets each conforming to the sectional shape thereof.

4,573,423

DEVICE FOR ADJUSTING THE STEP OF THE MAST OF A SAILBOARD OR SIMILAR

Thierry M. Dumortier, Hermee, Belgium, assignor to Fabrique Nationale Herstal, en abrege FN, Societe Anonyme, Herstal, Belgium

Filed Mar. 13, 1984, Ser. No. 588,984
Claims priority, application Belgium, Mar. 28, 1983, 2/60063
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—91 2 Claims



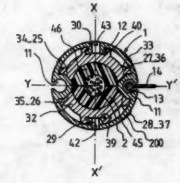
1. Device for adjusting the step of a mast of a sailboard comprising: a slider receiving the foot of the mast, said slider being associated with a slide adapted to be secured to the hull of the board; a friction locking means acting on the said slider for securing it relative to said slide and a control member provided for varying the friction of said locking means on the slider, thereby allowing the shifting of the latter relative to said slide; said locking means comprising a member secured through one of its ends to one end of said slide and forming at least one dead turn on an axle provided therefor on said slider and secured, at its other end, through a traction spring, to the other end of said slide.

4,573,424

SAIL SHORTENING ROLLER FOR SAILING BOATS

Pierre Clausin, Ville d'Avray, France, assignor to Proengin S.A., France

Filed Jan. 10, 1984, Ser. No. 569,636
Claims priority, application France, Jan. 13, 1983, 83 00593; Jun. 9, 1983, 83 09717; Nov. 25, 1983, 83 18985
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—106 22 Claims



1. A sail shortening device for rolling up a sail with a bolt-rope on a tubular element mounted for rotation about a rigging cable of a sailing boat and having a longitudinal axis and a lower zone, this device comprising:

at least two tubular sections connected end to end through a junction plane for forming said tubular element,

connecting means comprising at least one shaped connecting element engaging in said tubular sections, on each side of said junction plane and having an inner surface and two extreme edges extending parallel to said longitudinal axis,

two shaped end elements similar to the connecting element and mounted at both ends of the tubular element,

bearings, each comprising two semi-cylindrical parts, said bearings being housed respectively between said cable, said shaped connecting element and the two shaped end elements, so as to allow free rotation of the tubular element about the cable,

at least one longitudinal groove formed in the tubular element which comprises a longitudinal cavity with a section at least equal to the section of the bolt-rope and an outer longitudianl opening whose width is at least equal to the diameter of the bolt-rope in the lower zone of the tubular element and less than the diameter of the bolt-rope in the remaining part of the tubular element, so as to be able to introduce the bolt-rope into the longitudinal groove through the opening provided in the lower zone,

a device for axially holding the tubular element in position comprising an inner tubular sleeve fixedly mounted to the lower part of the tubular element and an outer sleeve, mounted for rotation on the inner tubular sleeve, and fixing means connecting the outer sleeve to a fixed part of the boat,

means for rotating said tubular element, coupled to said inner sleeve,

a swivel slidably mounted on the tubular element comprising an inner sleeve locked in rotation with the tubular element and comprising means for fixing the sail, an outer sleeve mounted for rotation on the inner sleeve and comprising means for fixing to a halyard for hoisting and tensioning the sail,

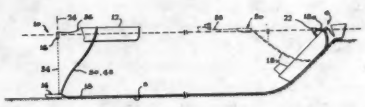
means for guiding the bolt-rope mounted in the lower zone of the tubular element for facilitating introduction of the bolt-rope inside the longitudinal groove.

4,573,425

RAPIDLY INSTALLABLE MOORING AND CARGO TRANSFER SYSTEM

George M. Pomonik, Van Nuys, and Martin B. Jansen, Agoura, both of Calif., assignors to Amtel, Inc., Providence, R.I.

Filed Sep. 4, 1979, Ser. No. 72,353
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 3 Claims



1. A rapidly deployable mooring and hydrocarbon transfer system for transferring hydrocarbons between a seabed pipeline and a floating offloading vessel at the sea surface, comprising:

a barge having a hull which is buoyant and seaworthy but which can be flooded and sunk and which has a lower surface formed to rest stably on the sea floor, and which has means for anchoring it to the seabed;

a fluid swivel assembly including a stationary swivel portion which is mounted on said barge and which has a first coupling positioned to connect to a largely horizontal seabed pipeline, and including a rotatable swivel portion which has a second coupling positioned to connected to a largely upwardly-extending hose structure that can connect to the offloading vessel, to maintain such connection during unlimited rotation of the vessel, all of said fluid swivel assembly lying at about the same level as the hull of said barge so that the barge with the fluid swivel assemly thereon is seaworthy;

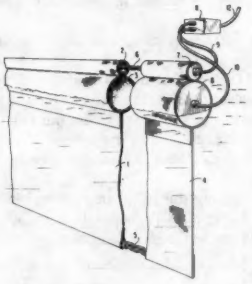
said barge including a buoy with hawser connecting means for connecting to one end of a hawser whose opposite end moors a ship said buoy releasably mounted on said barge, a mooring line chamber, and a mooring line having a majority of its length stored in said chamber and a first line end connected to said barge along the axis of said swivel assembly and a second end connected to said buoy, whereby to enable automatic deployment of a connected buoy upon sinking of the barge.

4,573,426

FLOATING BOOM

Erik J. Larsson, Gamleby, Sweden, assignor to Safe Bridge AB, Vastervik, Sweden

PCT No. PCT/SE83/00145, § 371 Date Dec. 15, 1983, § 102(e) Date Dec. 15, 1983, PCT Pub. No. WO83/03628, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 18, 1983, Ser. No. 576,281
Claims priority, application Sweden, Apr. 19, 1982, 8202444
Int. Cl.[4] E02B *15/02*
U.S. Cl. 114—267 6 Claims



1. In a floating boom for confining or preventing the spread of floating impurities, especially oil, which boom is arranged to be brought from a passive state, in which it may rest on the sea bed, to an active blocking state by being caused to float to the surface, said boom comprising:

an inflatable boom-raising hose for causing said boom to float to the surface, characterized in that said boom-raising hose is constituted by a high-pressure hose of a size such that the hose upon inflation gives a raising force sufficient to raise the boom from the sea bed and to keep it floating,

and wherein said boom-raising hose carries internally a chain 6 which acts as a weight to drive the hose and boom to the sea bed, which takes up tensile forces, which prevents folds being formed as the boom-raising hose sinks to the sea bed and which insures air passage therethrough, full evacuation of air therefrom, and complete collapse of the boom-raising hose during evacuation of air therefrom at one or both ends thereof when the hose is deflated.

4,573,427

BIRD SCARING DEVICE

Peter Konzak, Box 547, Devils Lake, N. Dak. 58301

Continuation-in-part of Ser. No. 388,040, Jun. 14, 1982, abandoned. This application May 31, 1983, Ser. No. 499,696
Int. Cl.[4] G08B *7/00*
U.S. Cl. 116—22 A 17 Claims

1. A bird scaring device comprising:

a frame;

visual means having active and inactive positions attached to said frame for scaring birds;

actuator means operatively connected to said visual means for moving said visual means between said inactive and said active positions; and

control means operatively connected to said actuator means for disabling said actuator means and thus said visual means in dependence upon predetermined ambient conditions, wherein said control means includes (a) light detector means for sensing daylight and night hours and for disabling said actuator means during said night hours, and (b) wind sensor means operatively connected to said actuator means for sensing wind velocity and for disabling said actuator in dependence upon sensing a wind velocity greater than a preestablished wind velocity, said wind sensor means including;

(a) means defining a predetermined surface area and being hingedly moveable between first and second positions;

(b) vane means for directing said surface area defining means into a wind velocity sensing position; and

(c) cover means operatively connected to said surface area defining means and displaceable therewith in response to movement thereof between said first and second positions

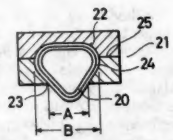
wherein said cover means is in a covering relationship with respect to said light detector means when said surface defining means is in said second position to prevent light from being sensed by said light detector means thereby disabling said actuator means and wherein said cover means in an uncovering relationship with respect to said light detector means when said surface defining means is in said first position to permit light to be sensed by said light detector means thereby permitting operation of said actuator means.

4,573,428

RELEASE AGENT APPLICATOR FOR USE WITH COPYING MACHINE

Takao Ogino; Hiroo Katsuya; Chiaki Kato; Itsuro Kato, and Tsutomu Kato, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd. and Sharp Kabushiki Kaisha, both of Osaka, Japan

Filed May 16, 1984, Ser. No. 610,747
Claims priority, application Japan, May 19, 1983, 58-88942
Int. Cl.[4] B05C *11/105*
U.S. Cl. 118—60 13 Claims



1. In a release agent applicator for use with a copying machine having a heated fixing roller and compression roller assembly for fixing a toner image to a toner image bearing material, a porous polyethylene tetrafluoride resin tube installed in a support in such a manner that a part of the tube which forms an outlet for a release agent contained in the tube projects from an opening in the support to the heated fixing and compression roller assembly, said porous tube having both ends sealed, wherein the improvement comprises: a tubular

form of a polymer film temporarily sealingly covering at least the entire outer surface of said release agent outlet of said porous tube to prevent leakage of the release agent contained in said porous tube through said outlet and having a melting point of less than 200° C. for removal of said polymer film covering at least said outlet after installation of said porous tube in said support.

4,573,429

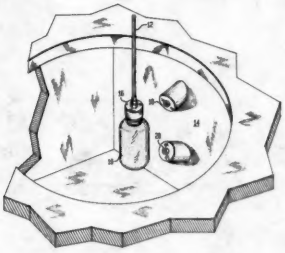
PROCESS FOR COATING SUBSTRATES WITH AQUEOUS POLYMER DISPERSIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 500,877, Jun. 3, 1983, Pat. No. 4,515,836, which is a continuation-in-part of Ser. No. 399,047, Jul. 16, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 638,222

Int. Cl.[4] B05B *13/02*

U.S. Cl. 118—322 **12 Claims**



1. A system for coating a substrate with a polymer coating comprising, in combination,

spray nozzle means for dispensing a stream of a stabilized dispersion of polymer in water,

means for actuating said nozzle means to dispense said stream,

means for locating said substrate in proximity to said nozzle means such that on actuation of said nozzle means said stream impacts on said surface initially forming a gel coating layer bonded to said surface and caused by destabilization of said dispersion upon said impact, said nozzle means adapted to continuously expose said gelled coating layer to said stream of stabilized polymer dispersion to produce a wet integral coating including a covering layer of polymer dispersion completely covering said gel layer, said gel layer serving as an interfacial layer to adhere said covering layer of polymer dispersion to said substrate, and

means for drying said wet integral coating to form a substantially completely gelled coating and to coalesce said polymer into a substantially uniform coating onto said substrate.

4,573,430

AUTOMATIC LEAD WIRE TINNING OF TAPE-PACKAGED COMPONENTS

Florence Benson, Big Lake, and Mark J. Shireman, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 7, 1984, Ser. No. 669,165

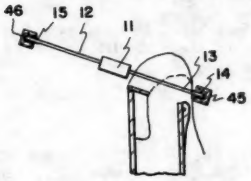
Int. Cl.[4] B05C *3/02*

U.S. Cl. 118—411 **3 Claims**

1. In combination:

a wave station establishing a wave of liquid solder having a convex configuration, transverse to an axis, which decreases in cross-sectional area with distance in a first direction along said axis;

and means transporting along said axis in said direction an electrical component having at least one linear conductor



extending transverse to said axis to pass through said wave.

4,573,431

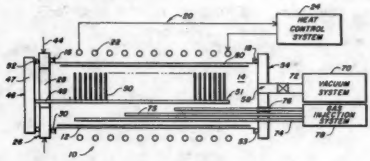
MODULAR V-CVD DIFFUSION FURNACE

Robert F. Sarkozy, Westford, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Continuation of Ser. No. 552,454, Nov. 16, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,920

Int. Cl.[4] C23C *11/00*

U.S. Cl. 118—725 **4 Claims**



1. A modular vacuum chemical vapor deposition CVD diffusion furnace, comprising:

a cylindrical diffusion tube having open ends and defining a cylindrical reaction chamber having an operative region along which CVD takes place;

a boat loader;

means for removably fastening said boat loader in air-tight sealing engagement with one of said open ends;

means coupled to said diffusion tube for controllably heating said reaction chamber;

a vacuum source;

a first metallic door having an aperture and a plurality of precisely aligned gas injection tube receiving openings provided through the door spaced from each other and from said aperture;

means for connecting said vacuum source to said aperture;

a plurality of gas injection tubes slidably received in a corresponding one of said plurality of precisely aligned gas injection tube receiving openings and each having an end terminating at longitudinally spaced points along said operative region of and within said reaction chamber;

a like plurality of vacuum couplings intermediate each of said gas injection tube receiving openings and a corresponding one of said gas injection tubes;

a gas control system operatively connected to said plurality of gas injection tubes; and

means for removably fastening said first metallic door to the other one of said ends of said cylindrical diffusion tube in air-tight sealing relationship.

4,573,432

WIRE MESH FLOORING

John F. Boxhorn, and George R. Boxhorn, both of Brookfield, Wis., assignors to C. I. Banker Wire & Iron Works, Inc., Milwaukee, Wis.

Filed Nov. 5, 1984, Ser. No. 668,514
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—28 6 Claims

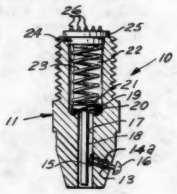
1. A wire mesh flooring comprising a plurality of substantially staight, parallel, spaced-apart warp wires each having the same cross-sectional area and a flat surface along its entire length, the widest portion of each warp wire being at or very near the top surface, and a plurality of parallel, spaced-apart cross wires extending alternately over and under adjacent warp wires, the top surface of each warp wire having a depression formed in it at each juncture with a cross wire to receive the cross wire so that the cross wire will not extend above the top surface of the warp wire, thereby providing a flooring that has a flat top surface with a plurality of openings therethrough which openings increase in size from the top to the bottom of the flooring.

4,573,433

SIDE ACTIVATED ANIMAL WATERING VALVE

Earl C. Thompson, 448 First St., Hewitt, Tex. 76632

Filed Aug. 3, 1984, Ser. No. 637,612
Int. Cl.[4] A01K *7/06*
U.S. Cl. 119—72.5 1 Claim



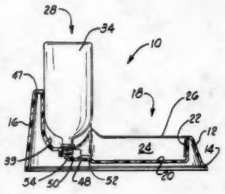
1. A side activated animal watering valve, comprising, in combination, a cylindrical main body, means on one end of said main body for attachment to a water supply source, an opposite end of said main body being conically tapered, a wide first central opening in said one end communicating with a narrower second central opening in said tapered end, a shoulder between said openings, a rubber "O"-ring rested against said shoulder, a shaft having an enlarged head at one end being inserted inside said main body, said shaft extending inside said second opening and said head resting against said "O"-ring, said shaft being thinner than said second opening to permit sidewardly tilting, a compression coil spring retained in said first opening bearing at one end against said stem head, and a transverse opening between an outer side of said tapered end and said second opening, and a rivet being slidable in said transverse opening, a button head on the outer end of said rivet, and a flat head on the inner end of said rivet, said flat head being configured larger than said transverse opening to retain said rivet in said transverse opening and being configured to selectively abut said shaft to effect the tilting thereof, said transverse opening being diagonally inclined respective to a longitudinal central axis of said cylindrical main body, and being generally perpendicular to said outer side of said tapered end, whereby when the watering valve is in an operative position the rivet tends to fall away from contact with said shaft.

4,573,434

PET WATERING APPARATUS

Robert P. Gardner, Tulsa, Okla., assignor to Fred C. Clark, Oklahoma City, Okla.

Filed Jul. 11, 1984, Ser. No. 629,775
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—77 14 Claims

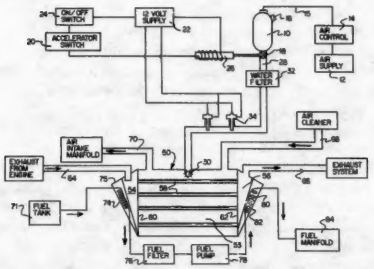


1. A pet watering apparatus comprising:
an outer wall portion;
an inner, upwardly opening water reservoir section comprising:
a lower surface; and
a plurality of walls extending upwardly from said lower surface and forming a first portion of a water-retaining boundary for said reservoir section;
a first upper surface connecting said first portion of said water-retaining boundary to said outer wall;
at least a first and second bottle holder forming a second portion of said water-retaining boundary, each of said bottle holders comprising:
a longitudinally truncated first substantially cylindrical upper portion dimensionally conforming to an outer surface of a bottle to frictionally hold said bottle in an inverted position;
an inwardly extending lower shoulder portion having a second cylindrical surface coaxial with said cylindrical upper portion and dimensionally conforming to an outer surface of a neck of said bottle to frictionally hold said neck, said second cylindrical surface defining a recess arranged to be in communication with an opening of said bottle adjacent said neck; and
a curvilinearly tapered intermediate section interconnecting said cylindrical upper portion and said lower shoulder portion;
a second upper surface connecting said bottle holders to said outer wall; and
a plurality of substantially horizontal upwardly opening water conduits, each conduit having a first end in communication with a bottle holder adjacent said recess thereof and a second end in communication with said water reservoir section adjacent said lower surface thereof;
wherein said outer wall portion, said water reservoir section, said bottle holders, said first and second upper surfaces and said water conduits are integrally molded on one-piece construction.

4,573,435
APPARATUS AND METHOD FOR GENERATING HYDROGEN GAS FOR USE AS A FUEL ADDITIVE IN DIESEL ENGINES

Glenn F. Shelton, Rte. 1, Box 333, Lawsonville, N.C. 27022

Continuation-in-part of Ser. No. 710,718, Mar. 12, 1985. This application Jun. 28, 1985, Ser. No. 749,733
Int. Cl.[4] F02B *43/10*
U.S. Cl. 123—3 **15 Claims**



1. Method for improving the fuel economy and emission quality of a diesel engine comprising the steps of:

(a) delivering water from a pressurized water source to the water inlet of a heat exchanger at a controlled rate determined responsive to the delivery of diesel fuel to said diesel engine;

(b) collecting the hot exhaust gases from said diesel engine and delivering them to the exhaust gas inlet of said heat exchanger;

(c) separating said exhaust gases into a plurality of tubes or pipes extending through said heat exchanger and having heat conducting walls;

(d) spraying water through said water inlet onto the surface of the heat conducting walls at such a rate as to reform the atomized water droplets into hydrogen gas, oxygen gas, and water vapor;

(e) the ratio of water delivered to the heat exchanger relative to diesel fuel delivered to the combustion chamber of said diesel engine being substantially in the range of 1:10 to 1:20;

(f) delivering said hydrogen gas, oxygen gas, and water vapor to the air intake of said diesel engine where it is mixed with air, introduced into the combustion chamber, and compressed prior to the introduction of said diesel fuel for combustion.

8. Apparatus for generating and delivering a mixture of hydrogen gas, oxygen gas, and steam for mixture with diesel fuel in the combustion chamber of a diesel engine comprising:

(a) a pressurized source of water;

(b) a heat exchanger having means associated therewith for receiving water from said water source and exhaust gases from said diesel engine in non-contacting, heat exchange relation to each other;

(c) means for controlling the flow of water to said heat exchanger responsive to the delivery rate of diesel fuel to the combustion chamber of said diesel engine;

(d) said heat exchanger comprising:

(i) an exhaust gas receiving manifold for receiving said exhaust gases from the combustion chambers of said diesel engine and a heat exchange compartment separated therefrom by a wall;

(ii) a bank of heat exchange tubes formed of a heat conducting material extending through said heat exchange compartment, said tubes being arranged in a bank including a plurality of rows and columns with spaces therebetween;

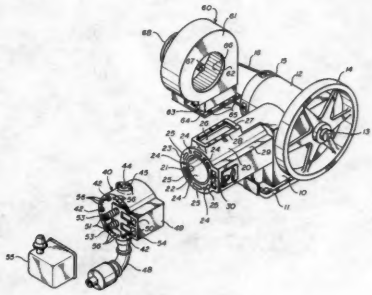
(iii) a spray nozzle mounted on the top wall of said heat exchange compartment above said bank of heat exchange tubes and connected to said pressurized source of water;

(e) means connecting the interior of said heat exchange compartment with said combustion chamber for circulating air through said heat exchange compartment and on to said combustion chamber whereby hydrogen gas, oxygen gas, and steam are delivered thereto.

4,573,436
AIR COOLED HORIZONTAL POWER PISTON ENGINE

Charles A. Owens, P.O. Box 474, Warren, Tex. 77664

Filed Nov. 22, 1983, Ser. No. 554,211
Int. Cl.[4] F01P *9/00*
U.S. Cl. 123—41.18 **15 Claims**



1. In a stationary horizontal power piston internal combustion engine having a design power output at maximum rpm of from about 11 to about 35 horsepower and having a cylinder head and engine block formed with internal water jackets designed to communicate through a radiator attached to said engine block to form a circulation loop closed to the atmosphere into which a liquid is received and circulated for liquid cooling of said engine, an improvement which adapts said engine to cooling by ambient air flow comprising:

a high volume air blower, said air blower taking in atmospheric air having a temperature as high as about 140° F., the air discharge end of which is mounted in close proximity to and in airtight sealing engagement to that mating surface on said engine block designed to receive a radiator unit for communication with the internal water jacket of said engine block, thereby minimizing resistance to air flow therebetween;

means for transmitting rotational motion of the crankshaft of said engine to said blower to operate said blower while said engine is in operation; and

a cylinder head provided with openings therein which communicate the internal water jacket of said cylinder head directly to the external atmosphere by which ambient air supplied by said blower to the internal water jacket of said engine block for circulation to the internal water jacket of said cylinder head is exhausted directly to the atmosphere through said openings after traversing once through the water jacket of said engine block and cylinder head.

4,573,437
SELF-PROPELLED VEHICLE

Ronald D. Morrison, 7836 Jasper Ave., Edmonton, Alberta T5H 3R9, Canada T5H 3R9

Continuation-in-part of Ser. No. 558,831, Dec. 7, 1983, Pat. No. 4,478,179. This application Sep. 26, 1984, Ser. No. 654,397
Int. Cl.[4] F02R *57/08*
U.S. Cl. 123—44 B **12 Claims**

1. A self-propelled vehicle which includes a body and a set

of four internal-force generating devices, each said device having a central axis about which internal portions thereof rotate, the four devices being configured as two opposed pairs, the two devices of one pair having parallel axes but turning in opposite directions, the two devices of the other pair also having parallel axes but turning in opposite directions, the axes of said one pair being at right angles to the axes of said other pair, each device comprising:

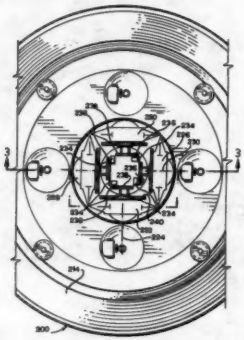
stationary frame means,

a stationary sun gear on the frame means, the sun gear being coaxial with the central axis of its respective device,

a rotor pivoted about the axis of the sun gear,

three crankshafts carried by the rotor at substantially 120° intervals, each having an eccentric portion,

for each crankshaft a cylinder in the rotor, a piston mounted



for reciprocation in each cylinder, and a connecting rod from the piston to the eccentric portion of the crankshaft,

each crankshaft being fixed to rotate with a respective planetary gear, all planetary gears meshing with the sun gear and having the same pitch diameter as the sun gear, whereby any point on the pitch circle of a planetary gear describes a cardioid as the planetary gear rotates around the sun gear once,

the crankshaft eccentricity being substantially ¼ of the pitch radius of a planetary gear,

fuel metering means for providing a combustible mixture for the cylinder,

ignition means to ignite the combustible mixture in each cylinder,

and valve means for admitting the combustible mixture to, and exhausting combustion gases from, each cylinder.

4,573,438

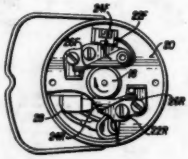
IGNITION SYSTEM

Daniel Whitfield, 320 E. Wythe St., Petersburg, Va. 23803

Filed Mar. 8, 1983, Ser. No. 473,828

Int. Cl.⁴ F02P *7/10*

U.S. Cl. 123—146.5 A **1 Claim**



1. In an ignition system for an internal combustion engine having at least one cylinder with an associated spark plug and at least power and exhaust strokes associated with such engine, ignition coil means and circuit breaker switch means in association with a cam shaft driven in timed relation to an engine crankshaft causing said spark plug to fire in advance of a power stroke, the improvement comprising:

means for insuring rapid opening and closing of a displaceable point assembly including:

cam lobe means on said cam shaft;

a point base assembly for supporting dual point assemblies in operative relation to said cam lobe means of said cam shaft;

said point base assembly comprising a pair of upper and lower superimposed plates, each of said plates respectively supporting a point assembly;

said upper plate having a portion removed for permitting the point assembly mounted on said lower plate to be operatively and independently adjusted with respect to said cam lobe means; and,

means for independently adjusting the respective point assemblies with respect to each other;

said plates including overlying, arcuate slots for accommodating lock means projecting therethrough and permitting rotation of said plates relative to the axis of rotation of the cam shaft, the uppermost plate having at least one slot of larger dimensions than the slot of the lower plate for accommodating therethrough a lock means to permit independent locking of the lower plate after it has been adjusted.

4,573,439

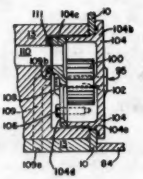
OIL PUMP ARRANGEMENT FOR SUPPLYING OIL UNDER PRESSURE IN AN INTERNAL COMBUSTION ENGINE

Edward W. Kasting, Seymour, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Division of Ser. No. 331,799, Dec. 17, 1981, Pat. No. 4,459,950, which is a division of Ser. No. 104,914, Dec. 18, 1979, Pat. No. 4,321,896. This application Jul. 17, 1984, Ser. No. 631,695

Int. Cl.⁴ F02B *77/14*

U.S. Cl. 123—195 A **2 Claims**



1. An oil pump arrangement for supplying oil under pressure in an internal combustion engine, which comprises in combination:

an internal combustion engine, one side of a portion of which is provided with a recess in a planar end wall thereof;

an oil pump having a two part housing comprised of an open-sided housing part and a closure means for closing off the open side of said housing part, and wherein said pump housing is of a size, relative to the size of said recess, for enabling said oil pump to be received within said recess with sufficient clearance to form a clearance space between said oil pump housing and walls of the engine defining said recess, said clearance space forming a suction space for said oil pump;

impeller gears which are provided in said pump housing and which mesh with one another;

driving means operatively connected to said internal combustion engine for driving at least one of said impeller gears;

a suction passage formed in the body of said internal combustion engine for providing communication between said

suction space and a source of oil, said pump housing including an opening for providing communication between said suction space and the interior thereof; and

a pressure passage means for communicating the interior of said pump housing with said internal combustion engine comprising a pressure passage formed in the body of said internal combustion engine and opening into said recess, a passage formed through said pump housing and means for interconnecting the pressure passage of the housing and the pressure passage of the engine body in a manner sealing-off said pressure passage means relative to said suction space.

4,573,440

METHOD FOR LIMITING THE SPEED OF AN INTERNAL COMBUSTION ENGINE IN A VEHICLE AND DEVICE FOR SAME

Reiner Pischke, Bad Friedrichshall, and Karl-Heinz Köhler, Ingolstadt, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

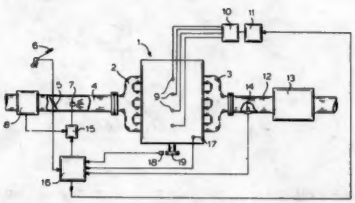
Continuation of Ser. No. 543,417, Oct. 19, 1983, abandoned.

This application Jun. 11, 1985, Ser. No. 743,280

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239052

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—333 **6 Claims**



1. A method for limiting the speed of an externally ignited fuel-injected internal combustion engine having a control device for generating a first optimized signal for controlling the fuel/air mixture fed into said engine and for generating a second optimized signal for setting the injection timing in accordance with the operational parameters of the engine, comprising:

monitoring the speed of rotation of said engine; and

simultaneously modifying said first and second optimized signals to reduce the amount of fuel in said fuel mixture and to advance said injection timing when said speed of rotation exceeds a first predetermined speed to reduce the power of the engine.

4,573,441

VALVE ARRANGEMENT

Stephan Wietschorke, Usingen; Gerhard Ruschek, Hattersheim, and Andreas Sausner, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

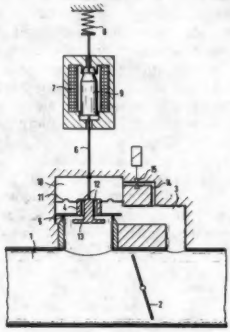
Filed Aug. 1, 1984, Ser. No. 636,530

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3328950

Int. Cl.[4] F02D *31/00*

U.S. Cl. 123—339 **14 Claims**

1. In a valve arrangement for adjusting the idling speed of an internal combustion engine having an intake manifold and a throttle valve in the manifold, by controlling the quantity of air at an intake side of the intake manifold leading to the internal combustion engine, including a bypass of the throttle valve, an electromechanical setting element having a solenoid connected to a closure member for the bypass via a setting member, a return spring biasing the setting member in a closing direction, said solenoid being adapted to urge said setting member in an opening direction against the force of the return spring, the closure member being urged in the opening direction by pressure at an admission side of the manifold, and the admission side being connected to a chamber including a movable wall



connected to a rear portion of the closure member, the improvement comprising:

means comprising another valve for connecting said chamber to the intake side of the manifold and for closing during a control operation of the closure member via said solenoid.

4,573,442

FUEL INJECTION PUMP HAVING A COMPACT SPILL-PORT TIMING CONTROL UNIT

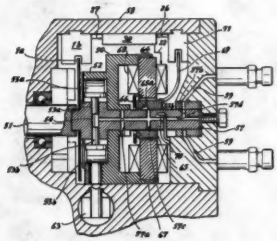
Toshimi Matsumura, Aichi; Masahiko Miyaki, Oobu, and Akira Masuda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 7, 1983, Ser. No. 501,789

Claims priority, application Japan, Jun. 10, 1982, 57-101178; Jul. 21, 1982, 57-127128; Aug. 25, 1982, 57-147175

Int. Cl.[4] F02M *59/20*

U.S. Cl. 123—450 **23 Claims**



1. A fuel injection pump, comprising:

a compression chamber adapted to be coupled to a source of fuel;

a plurality of fuel injection nozzles;

a rotary plunger rotatably driven by an internal combustion engine, the plunger including means for defining a common passageway connected at one end to said compression chamber, said plunger further including means for defining a plurality of angularly spaced apart spill ports branching off said common passageway to an outside surface thereof and a fuel delivery port branching off said common passageway, the fuel delivery port being selectively movable into and out of alignment with each one of said nozzles by rotation of the plunger;

a magnetized rotary ring including means for defining a spill groove extending along the inner wall thereof, said ring being mounted on said plunger and rotatable, with respect to said plunger, between at least a first angular position whereat said spill groove is out of alignment with said spill ports to establish a pressure tight relationship between the inner wall of said ring and the outer wall of said plunger and a second angular position whereat said groove is in alignment with at least one of said spill ports to provide a pressure relief action, said ring comprising a cylindrical structure having differently magnetized equally divided arcuate sections, said groove being formed on the inner wall of the cylindrical structure and substantially axially extending from one end of the structure;

spring means for biasing said ring toward one of said first and second angular positions;

a stationary core surrounding said ring; and

a coil wound on said core for generating a rotative thrust on said ring for selectively moving said ring between said first and second angular positions in response to a control signal.

4,573,443

NON-SYNCHRONOUS INJECTION ACCELERATION CONTROL FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

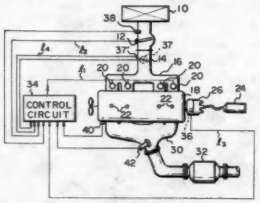
Haruo Watanabe; Kazuo Nakano, both of Okazaki, and Akito Ohnishi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 504,946, Jun. 16, 1983, abandoned. This application May 16, 1985, Ser. No. 734,816

Claims priority, application Japan, Sep. 16, 1982, 57-159446

Int. Cl.[4] R02B *3/10*

U.S. Cl. 123—492 **6 Claims**



1. A fuel-injection controlled internal combustion engine, comprising:

an engine body having a plurality of cylinders;

an intake line for introducing intake air into said engine body;

an exhaust line for removing exhaust gas from said engine body;

injector means for controllably injecting fuel into said intake line;

air flow detecting means for detecting an amount of air flowing through said intake line into said engine body and providing signals representative of said detected amount;

synchronous means for controlling said injector means synchronously with predetermined crank angles to cause fuel to be injected;

means for detecting the occurrence of a wide open throttle acceleration condition of said engine;

acceleration start time determining means for determining the start time of acceleration relative to the time occurrence of two prior and post consecutive synchronous fuel injections, in accordance with one of a detected wide open throttle acceleration condition and a throttle-position indicated acceleration condition; and

acceleration pulse means, responsive to said detected acceleration conditions, for operating said injector means to commence acceleration pulse fuel injections with said detected acceleration conditions, the width of said acceleration pulse fuel injections being determined in accordance with said start time occurrence of acceleration determined by said acceleration start time determining means.

4,573,444

FUEL INJECTION PUMPING APPARATUS

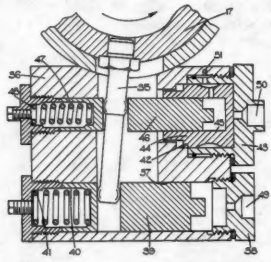
Peter Howes, Gerrards Cross, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 9, 1984, Ser. No. 670,023

Claims priority, application United Kingdom, Dec. 1, 1983, 8332110

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—502 **7 Claims**

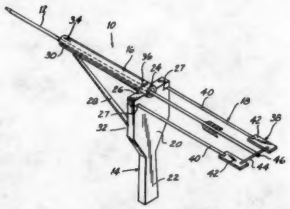


1. A fuel injection nozzle pumping apparatus for supplying fuel to an internal combustion engine, the apparatus comprising a body, a rotary distributor member mounted in the body, a high pressure pump including a plunger mounted in a bore in the distributor member and a cam ring mounted in the body, the cam ring defining a cam lobe which as the distributor member is rotated imparts inward movement to the plunger to displace fuel from said bore, the displaced fuel being directed by the distributor member to an outlet, a low pressure fuel supply pump for delivering fuel at a pressure which varies in accordance with the speed at which the apparatus is driven, control means for controlling the fuel flow from the low pressure to the high pressure pump thereby to determine the quantity of fuel supplied through said outlet, means for adjusting the angular setting of the cam ring to vary the timing of fuel delivery by the apparatus, said means including first and second pistons disposed in parallel side-by-side relationship, means coupling the pistons to the cam ring, resilient means biasing the pistons to urge the cam ring in one angular direction to retard the delivery of fuel, means for varying the fluid pressure applied to the pistons, the fluid pressure acting on said pistons in the direction to advance the timing of fuel delivery, a first cylinder housing the first of said pistons and passage means connecting one end of said cylinder to an outlet of the low pressure fuel supply pump, whereby the position of the piston is responsive to the speed at which the apparatus is driven, and a second cylinder housing the second of said pistons, a valve for admitting fuel under pressure to said second cylinder, a first switch responsive in use to the temperature of the associated engine and a second switch responsive to the setting of said control means, said switches controlling said valve, whereby fuel under pressure is supplied to said second cylinder only when the engine temperature is below a predetermined value and the quantity of fuel supplied by the apparatus is less than a predetermined value.

4,573,445
ARROW SLINGSHOT

Ted H. Webb, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Mar. 27, 1984, Ser. No. 594,031
Int. Cl.[4] F41B 3/00
U.S. Cl. 124—22 5 Claims

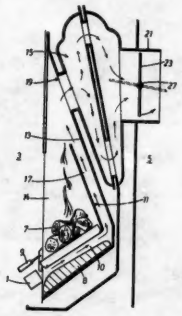


1. A slingshot for an arrow which comprises:
(a) a handgrip having a wide top portion and a narrow handle portion;
(b) a long barrel open at both ends and secured to said top portion of said handgrip; and
(c) means for propelling said arrow through said barrel, said means secured to said top portion of said handgrip, further comprising a brace member secured at an oblique angle between front portion of said barrel and forward middle area of said top portion of said handgrip; wherein said barrel further comprises a front sight and an open rear sight so that said arrow can be accurately aimed, wherein said means for propelling said arrow through said barrel comprises:
(d) an arrow receiving nocking member; and
(e) a pair of parallel elastic bands connecting said nocking member to said top portion of said handgrip, wherein said arrow receiving nocking member comprises:
(f) a pair of straps, each of said strap affixed at one end to one said elastic band; and
(g) a wire affixed transversely between said pair of straps to engage nock of said arrow.

4,573,446
GAS FIRES

Jozef Rosiek, Rainhill; Frank Spruce, Warrington, and Brian Atkinson, Wigan, all of England, assignors to Valor Newhome Limited, London, England

Filed Jan. 6, 1984, Ser. No. 568,633
Claims priority, application United Kingdom, Jan. 8, 1983, 8300463
Int. Cl.[4] F24C 3/04
U.S. Cl. 126—92 R 13 Claims



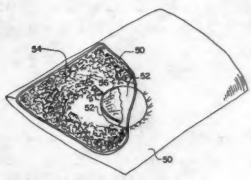
1. An open front, open flued, solid fuel effect gas fire assembly comprising a main gas burner and a subsidiary gas burner adapted to produce combustion products, means for directing the combustion products of said burners to a heat exchanger, said heat exchanger being configured to feed said combustion products to a flue means, an adjustable baffle being linked by a mechanical linkage, to a gas control tap which controls both the main and subsidiary burners, so that adjustment of the gas control tap can vary the flow through cross-section of the path of the combustion products of at least one burner to the flue means.

13. An open gas fire apparatus comprising a heat exchanger connected with a flue means, said heat exchanger defining at least one entry aperture for receiving combustion products from the front of a fire area, said at least one aperture incorporating a baffle arrangement for reducing the possibility of spillage of combustion products from the front of the fire area due to the effect of vortices, wherein such baffle arrangement comprises a generally horizontal plate projecting towards the front of the fire area and also partially inside the associated aperture, and a curved plate extending downwards from the generally horizontal plate and towards the adjacent side of the fire area.

4,573,447
CHEMICAL HEATER

Tommy K. Thrash, Littlefield; Richard W. Tock; Lyle V. Cox, both of Lubbock, and W. Gregg Quattlebaum, Slaton, all of Tex., assignors to Sunbelt America Corporation, Littlefield, Tex.

Filed Feb. 19, 1985, Ser. No. 703,685
Int. Cl.[4] F24J 1/02
U.S. Cl. 126—263 11 Claims



1. A heat pack comprising:
a. a flexible, substantially rupture and puncture resistant, fluid-tight envelope,
b. at least one rupturable fluid-tight container within the envelope,
c. cellulosic material within the envelope and without the container,
d. water within the container, and
e. a hypochlorite salt within the envelope, with
f. the hypochlorite salt being selected from the group consisting of sodium hypochlorite and calcium hypochlorite.

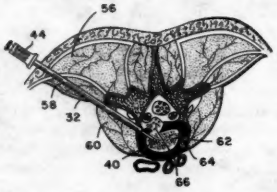
4,573,448
METHOD FOR DECOMPRESSING HERNIATED INTERVERTEBRAL DISCS

Parviz Kambin, Devon, Pa., assignor to Pilling Co., Fort Washington, Pa.

Filed Oct. 5, 1983, Ser. No. 539,256
Int. Cl.[4] A61F 17/32, 5/04; A61B 17/16
U.S. Cl. 128—1 R 11 Claims

1. A method for decompressing a herniated intervertebral disc in the lumbar region of a human patient comprising the steps of:
inserting a hollow needle with a stylet through the skin of the patient's back at a location spaced from the midline of the back and advancing the needle in an oblique direction with respect to a line perpendicular to the patient's back

until it reaches the outside of the annulus fibrosis of the herniated disc;
withdrawing the stylet;
introducing a guide wire through the needle to the disc;
withdrawing the needle;
passing a cannulated, blunt-tipped trocar with an opening in its tip slightly greater in diameter than the diameter of the guide wire, over the guide wire until the tip reaches the outside of the annulus fibrosis of the herniated disc;
withdrawing the guide wire;



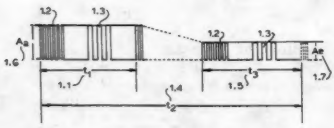
passing a thin-walled cannula which closely fits the trocar, over the trocar until the distal end of the cannula reaches outside of said annulus;
withdrawing the trocar;
introducing through the cannula a cutting instrument comprising a hollow circular cylindrical tube having cutting teeth formed in a circle on its distal end;
with the cannula still in place, forming a window in the herniated disc by rotary manipulation of the cutting instrument; and
with the cannula still in place, evacuating fragments of the herniated disc through the cannula.

4,573,449

METHOD FOR STIMULATING THE FALLING ASLEEP AND/OR RELAXING BEHAVIOR OF A PERSON AND AN ARRANGEMENT THEREFOR

Egon F. Warnke, Im Tannengrund 28, D-3002 Wedemark, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,353
Int. Cl.[4] A61N *1/34*
U.S. Cl. 128—1 C **2 Claims**



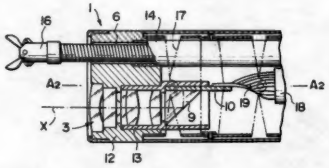
1. A method for inducing relaxed behavior in a person comprising the steps:
generating an oscillating signal;
converting said signal to an audible pulse train sequence having a pulse repetition rate substantially equal to the breathing rate of a person on the verge of falling asleep;
said audible pulse train sequence comprising two sounds of alternating frequency having a pause between them;
gradually reducing the pulse repetition rate and alternating frequencies over time;
instructing the person to inhale and exhale in time with the two sounds of alternating frequency; and
terminating said pulse train after a predetermined time interval.

4,573,450

ENDOSCOPE

Satoshi Arakawa, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Nov. 2, 1984, Ser. No. 667,770
Claims priority, application Japan, Nov. 11, 1983, 58-212947
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **6 Claims**



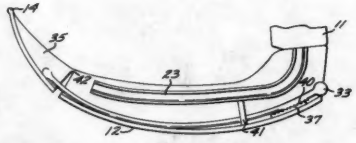
1. An endoscope capable of outputting an optical image obtained through an objective optical system as electric image signals by means of a face plate-like image sensor provided on the forward end of an insertion portion, comprising:
said objective optical system provided on the forward end of the insertion portion;
a light path changing member for changing the light path of an image pick-up light from said objective optical system into a direction perpendicular to the longitudinal direction of said insertion portion; and
a face plate-shaped image sensor opposed to a light emitting surface of said light path changing member and disposed on a plane incorporating therein the center axis in the longitudinal direction of said insertion portion.

4,573,451

LARYNGOSCOPE BLADE WITH A BENDABLE TIP

Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272

Filed Nov. 8, 1984, Ser. No. 669,475
Int. Cl.[4] A61B *1/26*
U.S. Cl. 128—11 **13 Claims**

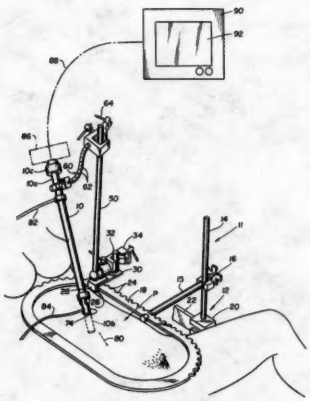


1. An elongated laryngoscope blade comprising:
(a) a main body;
(b) a separate, flexible tip adjacent the distal end of the main body;
(c) a continuous flange extending along a substantial length of the blade and interconnecting the main body and flexible tip, the portion of the flange between the main body and flexible tip having a pivot means; and
(d) means to urge the flexible tip about the pivot means.

4,573,452
SURGICAL HOLDER FOR A LAPAROSCOPE OR THE LIKE

I. Melvin Greenberg, 62 The Hemlocks, Roslyn Heights, N.Y. 11576

Filed Jul. 12, 1984, Ser. No. 630,372
Int. Cl.[4] A61B 17/02
U.S. Cl. 128—20 4 Claims



1. For surgical manipulation of a laparoscope engaged adjacent its exposed distal end and requiring its inserted proximal end to be positioned in proper viewing relation to anatomy to be observed therethrough, an assembly comprising, in combination, an open ring and means for supporting same in a fixed horizontal orientation over a patient having an incision for the insertion of said laparoscope proximal end, a generally vertically oriented support rod mounted adjacent its lower end at a selected location on said open ring, a selectively tensionable member extending from an end thereof engaged to said laparoscope to engagement of its opposite end to the upper end of said support rod such that prior to the tensioning of said tensionable member said laparoscope proximal end is manipulatable into a position that is proximate to that for proper viewing of said anatomy, and a ball and socket joint at said lower end of said support rod for permitting said rod to be urged through conical movement, whereby said laparoscope proximal end partakes of corresponding conical movement incident to assuming a more precise anatomy-viewing position while the weight of said assembly and laparoscope remains supported on said open ring.

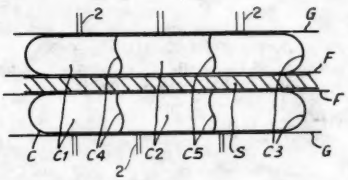
4,573,453
PRESSURE THERAPY APPARATUS

Jean Tissot, 26, Avenue Carnot, 91310 Verrieres Le Bousson, France

Filed Jun. 18, 1984, Ser. No. 621,432
Claims priority, application France, Jun. 16, 1983, 83 09957
Int. Cl.[4] A61H 7/00
U.S. Cl. 128—64 5 Claims

1. A pneumatic massage apparatus adapted for pressotherapy, which comprises:

an inflatable sleeve, the sleeve including first and second longitudinal walls, and lateral partition walls extending between the first and second longitudinal walls and joined thereto, the first and second longitudinal walls being formed of a gas impermeable, non-elastic material, the partition walls being formed of a flexible, gas impermeable, non-elastic material, the partition walls and first and second longitudinal walls defining therebetween separate inflatable chambers, inflation means on said sleeve for individually inflating each of said chambers, adjacent chambers being separated by a respective one of the partition walls, the length of each of the partition walls being greater than the distance between the first and second longitudinal walls wherein the inflation of one of the chambers at a gas pressure P causes the partition walls to

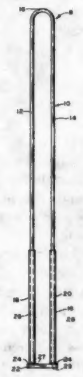


extend laterally and upon inflation of the next chamber at the same gas pressure P, the previously laterally extended partition wall laterally contracts due to the increased pressure in said next chamber thereby increasing the gas pressure in the previously inflated chamber.

4,573,454
SPINAL FIXATION APPARATUS

Gregory A. Hoffman, 4167 Woodstock Dr., Fort Wayne, Ind. 46815

Filed May 17, 1984, Ser. No. 611,475
Int. Cl.[4] A61F 5/01
U.S. Cl. 128—69 13 Claims



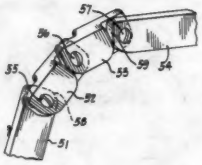
4. An implantable device for fixing the spinal column comprising:

a generally U-shaped first fixation element comprising two rigid, spaced apart, generally parallel elongate legs rigidly connected together by a cross portion located at one end of the first fixation element and each leg having a free end portion opposite said cross portion, said legs adapted to be located at each side of the spinous processes between the spinous and respective transverse processes, said first fixation element adapted to extend generally in a plane including the spinal column and extending perpendicular to the posterior to anterior direction, and

a second generally U-shaped fixation element comprising two generally parallel, elongate spaced apart legs rigidly connected together by a cross member at one end of the second element legs, each of said second fixation element legs being of sufficient length to extend along and be located at one side of a plurality of spinous processes between the spinous and respective transverse processes,

the free end portions of said first fixation element legs being slidably connected to said second fixation element legs for relative contraction and extension of the overall length of the connected first and second element assembly in the longitudinal direction lying in said plane, but restrained against relative movement in directions within the plane transverse to the longitudinal direction.

4,573,455
KNEE ORTHOTIC HINGE JOINT
David J. Hoy, 1095 County Rd. 2256, Perrysville, Ohio 44864
Filed Dec. 22, 1983, Ser. No. 564,507
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—80 C **4 Claims**



1. A hinge mechanism for following the motion of the human knee, said hinge mechanism comprising first, second, third and fourth hinge members,

said first hinge member being rotatably connected to aid second hinge member by a first hinge pin member at a first axis of rotation, said second hinge pin member being rotatably connected to said third hinge pin member by a second hinge pin member at a second axis of rotation, said third hinge member being rotatably connected to said fourth hinge member by a third hinge pin member at a third axis of rotation;

each said rotatable connection permitting rotation about its said axis of rotation independently of any other said rotatable connection;

said first, second and third axes of rotation being substantially mutually parallel lines so that the directions of rotation of each said hinge member, with respect to any other said hinge member rotatably connected to it, all are substantially parallel to the same plane of rotation;

means for restricting the angle of rotation between each two said rotatably connected hinge members to lie within 0° to 180°, as viewed from one side of said plane of rotation; said means comprising opposing sidewalls on each two said rotatably connected hinge members, which said opposing sidewalls contact each other when a predetermined angle of rotation is reached, thereby preventing rotation beyond said predetermined angle of rotation; and

said hinge mechanism further comprising a length of flexible tubing extending over and encasing the rotatable connections of said mechanism in the regions of said rotatable connections.

4,573,456
FOAM BODY SUPPORT
Donald C. Spann, Taylors, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.
Continuation of Ser. No. 491,249, May 3, 1983, abandoned. This application May 28, 1985, Ser. No. 738,501
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—80 R **1 Claim**

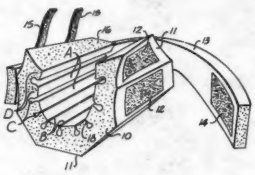
1. A support for receiving a limb of an orthopedic patient constructed essentially of a synthetic foam block comprising:

an arcuate body supporting surface in said synthetic foam block extending across a supported body portion of a human body;

a plurality of spaced, aligned cuts having been formed in said foam block by sawing in a predetermined continuous motion opening in said arcuate body supporting surfaces extending into said foam block;

an enlarged air channel having been formed in said foam block by sawing in the same motion of the saw forming said cuts in said foam block aligned with and forming a terminus for each of said cuts;

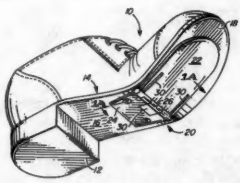
a segmented discrete support member formed between adjacent cuts and their respective channels; and



a foam strap with Velcro attachment means for receiving same to said block;

whereby body heat and moisture may be dissipated in air permeable enlarged air channels forming a ring of air about the limb and a yieldable support offered by said discrete support members.

4,573,457
TOE LIFTING SHOE
Thomas J. Parks, 1826 E. Evergreen, Mesa, Ariz. 85203
Filed Dec. 29, 1983, Ser. No. 566,781
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 E **2 Claims**



1. A toe-lifting show comprising a heel and a sole deflectable about a linear, flexible strip extending transversely across the sole and dividing the sole into a toe section having an upwardly sloping rear surface and an adjacent instep section comprising:

a. a flat, rigid toe plate coupled by securing means to the lower surface of the toe section of the sole and incldluing a linear rear surface extending transversely across the sole in proximity to the flexible strip;

b. a flat, rigid instep plate coupled by securing means to the lower surface of the instep section of the sole and including a linear front surface extending transversely across the sole in proximity to the flexible strip with a gap disposed between the linear front surface of the instep plate and the linear rear surface of the toe plate;

c. a hinge having a cylindrical body positioned within said gap and oriented parallel to the adjacent linear surface of the toe plate and instep plate for pivotally interconnecting the toe and instep plates, the cylindrical body of the hinge further including a cylindrical aperture for receiving a hinge pin; and

d. a spring coupled to the hinge, surrounding the hinge pin, and including a first spring element extending outward from the hinge to engage the toe plate and a second spring element extending outward from the hinge to engage the instep plate for upwardly biasing the toe plate with re-

spect to the instep plate and for angularly deflecting the toe section of the shoe with respect to the instep section of the shoe along the flexible strip, whereby the spring acting on the toe and instep plates upwardly pivots the toe section with respect to the instep section without angularly deflecting the instep section when the shoe is in an unweighted state and permits the toe section to be downwardly pivoted with respect to the instep section when the shoe is in a weighted state, wherein the cylindrical body of the hinge and the flexible strip are positioned within the upwardly sloping rear surface of the toe section to avoid transferring substantial forces between a flat walking surface and the sole.

4,573,458

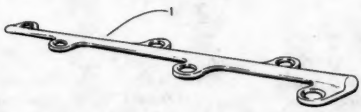
BONE FIXATION PLATE

Jerry L. Lower, Bourbon, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Continuation of Ser. No. 408,585, Aug. 17, 1982, abandoned. This application Feb. 5, 1985, Ser. No. 698,263

Int. Cl.[4] A61F *1/00*

U.S. Cl. 128—92 D **23 Claims**



1. An implantable bone plate comprising:

(a) a solid, elongated rod, void of any holes throughout its length; and

(b) a plurality of integral tab members protruding laterally from said solid rod, said tab members having an aperture therein for receiving a bone screw or the like, and wherein said tab members have a thickness less than the thickness of the rod and wherein said rod includes a bottom bearing surface and wherein said tab members have a bottom surface extending in substantially the same plane as the bearing surface of the rod.

4,573,459

THUMB AND FINGER EXTENSION DEVICE

Bruce W. Litton, 9533 Shiloh Wood Ct., Indianapolis, Ind. 46234

Filed Aug. 25, 1983, Ser. No. 526,475

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 A **9 Claims**

1. An extension device for extension of a digit, such as a thumb or finger, comprising:

a plurality of proximal bone pins adapted to extend laterally through a first one of two separated bone segments in a digit to be extended longitudinally;

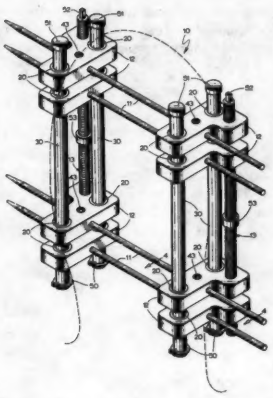
a plurality of distal bone pins adapted to extend laterally through the other one of said two separated bone segements;

means for progressively extending the distance between said proximal and distal bone pins;

means for maintaining said proximal and distal bone pins in relative alignment as said digit is progressively extended by operation of said extending means, said maintaining means including

a pin retaining member corresponding to each of said bone pins, each said pin retaining member receiving a different one of said bone pins, and

a pair of guide posts slidably received through each of said pin retaining members, said guide being positioned on opposite sides of said bone pins; and generally aligned with the direction of extension of said digit; and said



extending means being laterally offset from said guide posts.

4,573,460

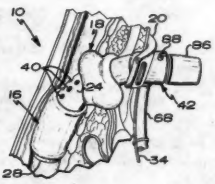
TALKING TRACHEOSTOMY TUBE

Edward H. Szachowicz, St. Louis Park, and John Walsh, LaCrescent, both of Minn., assignors to Implant Technologies, Minneapolis, Minn.

Division of Ser. No. 417,727, Sep. 13, 1982, Pat. No. 4,449,523. This application May 15, 1984, Ser. No. 610,417

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—200.26 **11 Claims**



1. In a tube for insertion into the trachea of a patient to support breathing through a tube passageway having a first end for placement within the trachea below the larynx for directing air or oxygen towards the lungs of the patient and a second end located outside of the trachea and the patient for receiving air or oxygen, and first means for sealing between the tube and the trachea below the larynx for substantially preventing air or oxygen from escaping from the first end of the tube upward in the trachea towards the larynx, with the tube including a wall having an outside surface, and an inside surface, a cannula having said tube passageway located within the tube, with the improvement comprising means for allowing the patient to phonate comprising, in combination: a secondary passageway located within the tube; second means adjacent the second end of said tube for introducing air or oxygen to the secondary passageway; and at least one port formed through the wall of the tube above the first sealing means in fluid communication with the secondary passageway for introducing air or oxygen above the first sealing means into the trachea for movement towards the larynx of the patient, wherein the secondary passageway is defined by said cannula having a

cross section that is generally circular in shape but having a flat surface along a chord of the circular cross section that extends the length of said cannula, whereby the secondary passageway is formed between the inside surface of the tube and the flat surface of the cannula, and wherein the tube includes means adjacent the first end thereof for preventing air or oxygen from escaping the secondary passageway below the first sealing means.

4,573,461

NASAL SEALER AND FILTER

Norman M. Lake, 1705 Newport Dr., Lancaster, Pa. 17602

Continuation-in-part of Ser. No. 288,056, Jul. 29, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 542,715

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—201.18 **2 Claims**

1. A new process of employing a particular seal and filter for helping the human nose maintain its mucous membranes in good condition, the seal comprising an oblong ellipsoid shaped solid of soft pliable impervious material, the filter differing therefrom only by being porous, the steps of:

(a) inserting into each nasal cavity a solid seal to close off the nasal passages promptly when the nose is threatened by harmful material breathed therein as evidenced by sneezing, dripping nose and often a slight scratchy feeling in the throat, this being done for a period of 30 minutes or more for the purpose of invisibility, and preventing cool air, infectious and allergenic agents from entering the nose, while simultaneously increasing the temperature within the nose, thereby creating an environment therein that inhibits growth of the common cold virus and establishing in the nose a condition "having certain characteristics similiar to inflammation", but without the pain and suffering of inflamed and swollen membranes;

(b) then immediately following the 30 minutes or more time period, the solid seal in each nasal cavity is replaced by a filter of soft pliable, but porous, material of precisely the same size and shape as the nasal seal for trapping and minimizing harmful material entering the nose, this porous filter can be worn as long as desired with a minimum of discomfort; and,

(c) when the nose again is threatened by harmful material, the porous filter can be replaced with the solid seal in each nasal cavity for the time period as set forth above.

4,573,462

RESPIRATORY SYSTEM

Marcel Baum, Vienna, Austria, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

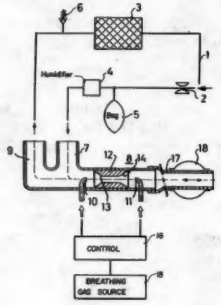
Filed Apr. 4, 1984, Ser. No. 596,620

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313855

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.25 **7 Claims**

1. A respiratory gas system, comprising a ventilating gas source, a closed circuit respiratory gas ventilating circuit connected to said ventilating gas source and having pressure relief means therein and a gas feed part connected into said gas ventilating circuit, said feed part having one end with an inlet portion and an outlet portion connected into said closed circuit respiratory gas ventilating circuit such that gas flows through said inlet portion and outlet portion, said gas feed part having a tubular intermediate portion communicating with said inlet and outlet portion, a breathing gas source first and second jet nozzles connected to said breathing gas source and extending into said tubular opposite end portion at spaced locations therein dischargeable in respective opposite axial directions to supply breathing gas into said tubular opposite end portion



through said first and second jet nozzles, a patient connection means connected to said feed part at the opposite end thereof, and control means between said breathing gas source and said jet nozzles for alternately directing said breathing gas source to said jet nozzles so as to form suction areas in said feed part thereby inducing alternating, oppositely directed flows of the ventilation gas through said feed part between said closed circuit respiratory gas ventilation circuit and said patient connection means.

4,573,463

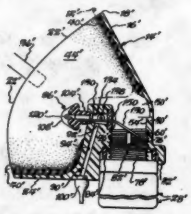
BREATHING MASK

Lester B. Hall, 249 Kinsey Ave., Kenmore, N.Y. 14217

Filed Aug. 2, 1982, Ser. No. 404,059

Int. Cl.[4] A62B *9/00, 18/02*

U.S. Cl. 128—205.24 **8 Claims**



1. Breathing apparatus comprising:

(a) a body in the form of a mask shaped to be worn over a portion of a user's face;

(b) a breathing passage formed in said body having an outlet at one end adapted to be in fluid communication with only the nose of the wearer and having an inlet at the other end thereof;

(c) a container holding a quantity of gas for breathing and having an outlet, said body having means for connection to said container with said container adjacent to and supported exclusively by said body and said container outlet being in fluid communication with said breathing passage inlet, said container releasing a flow of gas to said breathing passage and thereby to only the nose of the wearer;

(d) an exhalation passage defined by said body separate from said breathing passage having an inlet at one end adapted to be in fluid communication with only the mouth of the user so that the user does not inhale from and exhale to the same passage in said body, said exhalation passage having an outlet open to the atmosphere; and .

(e) holding means on said body connected to said exhalation passage inlet and adapted to be received between the teeth of the wearer in gripping engagement for holding said apparatus in place on the head of the user and adapted for sealing engagement with the mouth of the user for allowing the user to exhale exclusively therethrough from the mouth to the exhalation passage.

4,573,464

FILTER RESPIRATOR FOR PROTECTION AGAINST SMOKE AND TOXIC GASES

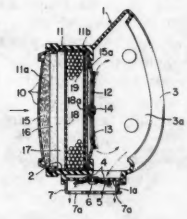
Bynyo Yo, 25-9, Kitamagome 2-Chome, Ota-Ku, Tokyo-To, Japan

Filed Aug. 4, 1982, Ser. No. 405,161

Claims priority, application Japan, Aug. 7, 1981, 56-123614

Int. Cl.[3] A62B *7/10*

U.S. Cl. 128—206.15 **7 Claims**



1. A respirator for protection against smoke and toxic gases, comprising a respirator body having means to cover the breathing passages of a user, means for attachment of said body to the head of a user, said body defining with the head of a user a breathing cavity, said body being provided with an inlet opening communicating the breathing cavity to a source of smoke and toxic gases, said opening shaped to detachably receive a cylindrical filter vessel, said body also having discharge ports, a discharge valve means attached over said discharge ports so as to open the discharge ports only when the user wearing the respirator exhales, a cylindrical filter vessel, said filter vessel being detachably received in said opening and further comprising an outer end wall with intake holes adjacent said source of gases and an inner end wall with intake ports adjacent said breathing cavity, an intake valve means attached over the intake ports of the inner end wall so as to open said intake ports only when the user wearing the respirator inhales, a noble-metal oxidizing catalyst disposed within said filter vessel adjacent to said inner end wall, an electrostatic smoke-filtering material comprising an unwoven fiberous material which has been subjected to electrostatic charging treatment, and an activated carbon fiber material, said smoke-filtering material and activated carbon fiber material being disposed within said filter vessel upstream from said noble-metal catalyst with respect to the flow of smoke and toxic gases from said intake holes to said intake ports, whereby smoke is prevented from arriving at the noble-metal catalyst.

4,573,465

LASER IRRADIATION APPARATUS

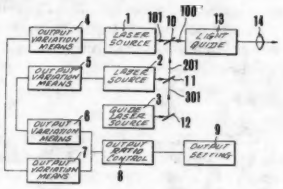
Seiji Sugiyama, Kanagawa; Norihiro Suenaga; Nobuyuki Suenaga, and Michihiro Kaneda, both of Kanagawa, all of Japan, assignors to Nippon Infrared Industries Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1982, Ser. No. 442,082

Claims priority, application Japan, Nov. 19, 1981, 56-186165

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **3 Claims**



1. A laser irradiating apparatus adapted for simultaneously or selectively irradiating laser beams on an object, comprising:

a plurality of laser sources each outputting laser beams of different wave-length;

optical means for co-axially overlapping the laser beams;

light guide means for transmitting the overlapped laser beams respectively to a desired portion of the object to be irradiated;

a plurality of laser output variation means, connected individually and respectively to each of the laser sources, for introducing a high voltage to each of the laser sources;

a plurality of laser output variation signal means, responsive to input signals, for controlling respective of the laser output variation means;

mixing ratio setting means for providing input signals to the laser output variation signal means to vary the output ratio of the plurality of laser sources; and

laser output setting means, connected to the mixing ratio setting means, for controlling said mixing ratio setting means to thereby set the outputs of the laser sources.

4,573,466

SURGICAL EQUIPMENT

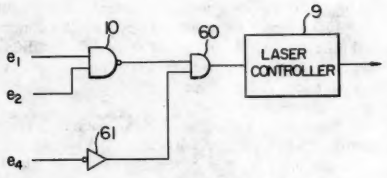
Tamotu Simada, Akishima; Chiaki Shimbo, Mitaka; Hideyuki Horiuchi, Kokubunji, and Masamoto Takatsuji, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,184

Claims priority, application Japan, May 29, 1981, 56-77241[U]; Apr. 7, 1982, 57-56609

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **44 Claims**



1. A surgical equipment for producing a surgical output power from a hand piece, comprising

a hand piece connected to a source of surgical output power for applying said surgical output power to an object under operation;

sensing means provided on said hand piece for sensing an

operator holding said hand piece and providing an output in response to said holding;

control means responsive to the output of said sensing means for enabling said surgical output power to be produced; and

switch means for controlling the transmission of the surgical output power, said switch means providing an output signal when said switch means is activated, and wherein said control means includes logic means for receiving the output from said sensing means and the output signal from said switch means and allowing the output signal of said switch means to control the transmission of the surgical output power while said sensing means senses the holding of said hand piece.

4,573,467

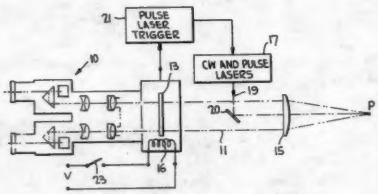
OPTICAL COUPLING DEVICE FOR BIOMICROSCOPE

Alan H. Rich, Ft. Washington; Douglas E. Gaasterland, Potomac, and Thomas E. Tedder, Silver Spring, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 13, 1983, Ser. No. 494,378

Int. Cl.[4] A61B *17/36*; A61N *5/00*

U.S. Cl. 128—303.1 **15 Claims**



1. Apparatus for use in conjunction with a biomicroscope and a pulsed laser for delivering high power laser pulses to a living tissue site to effect medical treatment of that tissue, the apparatus comprising:

a housing;

mounting means for securing said biomicroscope to said housing to establish an observation path for said biomicroscope through said housing;

an objective lens secured to said housing in said observation path for focusing said observation path at said living tissue site;

means for delivering said high power laser pulses into said housing along a first laser beam delivery path;

a mirror assembly disposed in said housing and having a reflective surface disposed along said first laser beam delivery path for reflecting said high power laser pulses along a second laser beam delivery path extending through said objective lens, said mirror assembly further comprising means for selectively positionally controlling said reflective surface in each of three different directions to direct said high power pulses to be focused by said objective lens at said tissue site;

wherein said mirror assembly includes:

a shaft having: a longitudinal axis, a generally cylindrical portion at a first end, a pivot bearing at a second end, said pivot bearing having a generally convex configuration, and a mirror mounting section disposed intermediate said first and second ends and mounting said reflective surface;

shaft receiving means in said housing for receiving said generally cylindrical portion of said shaft in a journal-type engagement to permit rotation of said shaft about said longitudinal axis; and

a bearing pad secured to said housing and urged axially against said pivot bearing at said second end of said shaft.

4,573,468

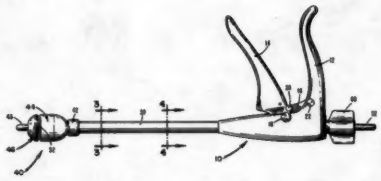
HOLLOW BODY ORGAN STAPLING INSTRUMENT AND DISPOSABLE CARTRIDGE EMPLOYING RELIEF VENTS

Robert L. Conta, and Harvey N. Wallach, both of Trumbull, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 967,421, Dec. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,965, May 26, 1977, abandoned. This application Aug. 26, 1981, Ser. No. 296,525

Int. Cl.[4] A61B *17/11, 17/32*

U.S. Cl. 128—305 **4 Claims**



4. Apparatus for joining the ends of two hollow tubular organ sections with an annular array of surgical staples extending through abutting, inwardly turned end portions of the organ sections, the operating portion of said apparatus being inserted longitudinally through a first of the organ sections and being withdrawn from the organ sections immediately after joining by pulling the apparatus longitudinally out through the first organ section, said apparatus comprising:

a longitudinal shaft assembly having a cylindrical outer surface characterized by a relatively small circumference;

actuator means mounted on the proximal end of the shaft assembly, said actuator means remaining outside the organ sections at all times;

a staple-holding assembly mounted on the distal end of the shaft assembly, the staple-holding assembly having a cylindrical outer surface characterized by a relatively large circumference selected to fit snugly within said first organ section, the staple-holding assembly containing an annular array of distally directed surgical staples which are driven in response to operation of the actuator means and having at least one vent hole extending from the interior of the staple-holding assembly to the exterior of the apparatus proximally of the cylindrical outer surface of the staple-holding assembly; and

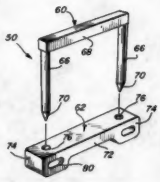
an anvil assembly mounted for longitudinal reciprocal motion relative to the distal end of the staple-holding assembly in response to operation of the actuator means, the anvil assembly having a cylindrical outer surface characterized by said relatively large circumference, the anvil assembly being adapted to fit within the second organ section and to clamp the abutting, inwardly turned end portions of the organ sections against the distal end of the staple-holding assembly so that the anvil assembly clinches the ends of the surgical staples when they are driven from the staple-holding assembly through the clamped end portions of the organ sections, the anvil assembly having at least one vent hole extending from the interior of the anvil assembly to the exterior of the apparatus distally of the cylindrical outer surface of the anvil assembly, the anvil assembly vent hole communicating with the staple-holding assembly vent hole through the space between the interiors of the anvil assembly and the staple-holding assembly to facilitate insertion and withdrawal of the apparatus by allowing gases and liquids in the organ sections to flow around the portions of the apparatus having the cylindrical surfaces of relatively large circumference via the interior of those portions of the apparatus.

4,573,469

TWO-PIECE TISSUE FASTENER WITH COINABLE LEG STAPLE AND RETAINING RECEIVER AND METHOD AND INSTRUMENT FOR APPLYING SAME

Donald M. Golden, Cherry Hill, N.J., and William P. McVay, Clearwater, Fla., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 20, 1983, Ser. No. 506,151
Int. Cl.[4] A61B 17/04
U.S. Cl. 128—334 C 8 Claims



5. A fastener adapted to hold together separated portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

an open loop fastening member, said fastening member comprising a pair of legs adapted to penetrate said tissue portions and a link connecting said legs that is adapted to lie substantially against one of said tissue portions;

a receiver adapted to be disposed against the other of said tissue portions opposite said fastening member, said receiver having means for receiving said fastening member legs after said legs have been inserted through said tissue portions, said receiver means including at least one passage in said receiver for receiving one of said fastening member legs, said receiver including a first aperture communicating from the exterior of the receiver with the interior of said passage and a second aperture opposite the first aperture communicating from the exterior of the receiver with the interior of said passage,

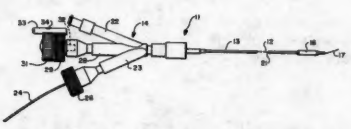
at least a portion of said legs consisting of a material that is initially deformable under the application of a predetermined amount of pressure to effect engagement of the fastening member legs and receiver after the tissue portions have been penetrated by said fastening member legs and after said legs have been received in said receiver.

4,573,470

LOW-PROFILE STEERABLE INTRAOPERATIVE BALLOON DILITATION CATHETER

Wilfred J. Samson, Saratoga, and Jeffrey S. Frisbie, San Jose, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed May 30, 1984, Ser. No. 615,141
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—344 4 Claims



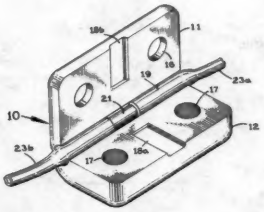
1. In a low-profile steerable intraoperative balloon dilatation catheter, a flexible core wire having proximal and distal extremities, a flexible tubular member extending over the core wire and having proximal and distal extremities with the distal extremity being bonded to the distal extremity of the core wire to form a liquid-tight seal, a balloon carried by the distal extremity of the flexible tubular member, the flexible tubular member providing a lumen extending from the proximal end of the flexible tubular member and extending into the balloon, and an adapter secured to the proximal ends of the core wire and the flexible tubular member, the adapter having at least first and second arms with the core wire extending through the first arm and the lumen being in communication with the second arm, means carried by the first arm and secured to the core wire for permitting rotation of the core wire while limiting movement longitudinally of the axis of the core wire, the catheter having a length so that there is approximately a one-to-one correspondence in rotation of the tip of the core wire with the rotation of the core wire at the proximal extremity.

4,573,471

PROSTHETIC APPARATUS FOR SURGICAL ANASTOMOSIS

Merritt A. Rudner, 4191 NW. 41st St., Apt. #418, Lauderdale Lakes, Fla. 33319

Filed Jul. 9, 1984, Ser. No. 629,007
Int. Cl.[4] A61B 17/11
U.S. Cl. 128—346 15 Claims



1. A joining system for the ends of organic tubular vessels to be anastomosed, the system comprising:

a tubule having an inside diameter substantially equal to the inside diameter of the ends of the vessels to be joined by being drawn over the ends of the tubule;

a clamp having an open and a closed position, consisting of two substantially planar clamp parts having between them a cylindrical channel for receiving and clamping walls of the ends of the vessel to the outside of the tubule;

means for drawing together said clamp parts into their closed position; and

means for monitoring the clamping pressure exerted against the walls of the vessel.

4,573,472

AUTOGENIC TRAINING AND TREATING APPARATUS

Yoshihiro Ito, 7-1 and 8 Gacchi, Imachi, Hanazono, Ukyo-ku, Kyoto, Japan

Filed Sep. 22, 1982, Ser. No. 421,643
Claims priority, application Japan, Sep. 25, 1981, 56-152417; Mar. 15, 1982, 57-41413
Int. Cl.[4] A61F 7/00
U.S. Cl. 128—399 20 Claims

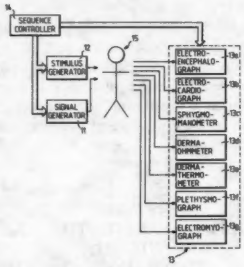
1. An autogenic training and treating apparatus comprising:

signal generating means for giving a subject a notification signal,

stimulus generating means for applying a stimulus to the subject's body, and

sequence control means for driving said signal generating means and said stimulus generating means in a sequence in accordance with a sequence program, wherein said sequence program causes (a) said notification signal to be generated periodically throughout the sequence, (b) said stimulus to be generated during a first stage of the se-

quence in regular correspondence with said periodically generated signal, and (c) said stimulus to be generated during a second stage of said sequence only in intermittent correspondence with said periodically generated signal.

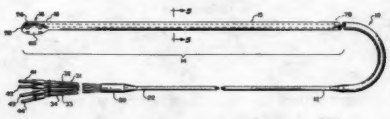


4,573,473

CARDIAC MAPPING PROBE

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 13, 1984, Ser. No. 599,950
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—642 **15 Claims**



1. A cardiac mapping probe comprising: a lead body having a distal end, a distal end portion and a proximal end and comprising a tubular sheath, a head with a pad having a flat surface mounted at said distal end of said lead body, said pad being located on a side of said tubular sheath such that said flat surface of said pad faces radially outwardly from an elongate axis of said lead body, at least two electrodes on said flat surface of said pad, at least two wire conductors within said tubular sheath and extending the length thereof and being connected to said electrodes, and pliable, moldable means in the form of a ductile metal rod which has a coating thereon to prevent contamination of blood or body tissue with the metal of the rod, which is stiff but bendable, which is rounded at each end to provide said rod without sharp edges and which is mounted within said distal end portion of said lead body for providing said distal end portion with the capability of being formed into various shapes whereby it can be molded and formed into any desired configuration for facilitating holding of said distal end portion and placement of said at least two electrodes against a heart wall and can hold such configuration until remolded and reformed into another configuration.

4,573,474

CABLE HARNESS FOR AN ELECTROCARDIOGRAM DEVICE

James S. Scibetta, 255 Hosea Ave., #1, Cincinnati, Ohio 45220

Filed Jul. 27, 1984, Ser. No. 635,254
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—644 **21 Claims**

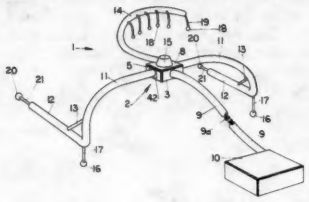
1. A cable harness device for use with an EKG machine or the like comprising:

a central support unit;

at least one pair of laterally extending elongated arms mounted to said central unit, each of said arms supporting an EKG electrode for engagement with a patient's upper torso;

an elongated boom mounted to said central unit and supporting an EKG electrode for engagement with a patient's chest area; and

means for electrically connecting said electrodes to an EKG machine.

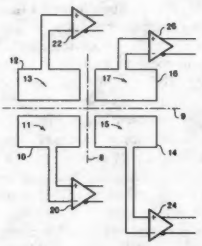


4,573,475

RECEIVING RADIATION FROM LOOPS IN A COMMON PLANE FOR MONITORING HOSPITAL PATIENTS LEADLESSLY

John N. Dukes, Los Altos Hills, Calif., and Edwin B. Merrick, Stow, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 15, 1984, Ser. No. 671,399
Int. Cl.[4] A61N 5/00
U.S. Cl. 128—653 **8 Claims**



1. A system for receiving electromagnetic radiation comprising:

a plurality of electrically conductive wire loops in a substantially common plane, each of said plurality of electrically conductive wire loops producing a respective first signal in response to said electromagnetic radiation;

a plurality of receiving means for receiving said respective first signals, each of said plurality of receiving means being connected respectively to one of said plurality of electrically conductive wire loops; and

a plurality of combining means, each of said combining means being connected to said plurality of receiving means for selectively combining a plurality of said first signals to form an equivalent received signal from an equivalent antenna.

4,573,476

ANGIOGRAPHIC CATHETER

Oscar F. Ruiz, 3655 Bay Homes Dr., Coconut Grove, Fla. 33133

Filed Nov. 14, 1983, Ser. No. 551,561
Int. Cl.[4] A61M 25/00
U.S. Cl. 128—658 **5 Claims**

1. An improved angiographic catheter for injection of radio opaque contrast material intra vascularly comprising:

an elongated horizontal member;

an intermediate member said elongated horizontal member and said intermediate member including a lumen portion;

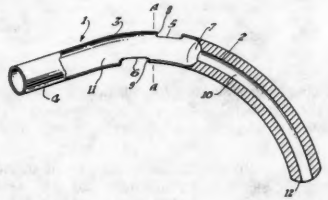
a tip zone member, including a smaller lumen portion, said smaller lumen having a constant diameter and opening out through the tip end, said members being functionally integral;

said intermediate member positioned between said elongated horizontal member and said tip zone member;

said intermediate member including at least a first and a second aperture;

said first aperture positioned between said tip zone member and said intermediate member;

said second aperture positioned between said first aperture and said elongated horizontal member;



said aperture being of a size to permit approximately 70% of the contrast material to flow therethrough while the remaining 30% exits through the small lumen tip end, said side flow reducing shock to the blood vessel wall during angiographic procedures,

said intermediate member being curved from said elongated horizontal member at an angle of less than 90° and

said intermediate member being curved from said elongated horizontal member at an angle of less than 90° and having its free end space a short distance from the longitudinal axis of said elongated horizontal member.

4,573,477

ULTRASONIC DIAGNOSTIC APPARATUS

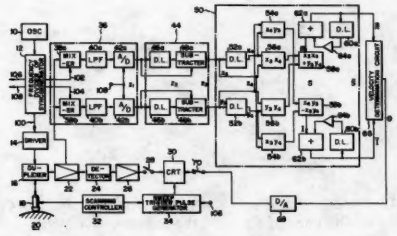
Koroku Namekawa; Akira Koyano, and Chihiro Kasai, all of Tokyo, Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,147

Claims priority, application Japan, Apr. 28, 1982, 57-70479

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—663 **2 Claims**



1. An improved ultrasonic diagnostic apparatus including an ultrasonic probe means adapted to repeatedly transmit ultrasonic pulse beams into a living organism at a fixed pulse rate and means adapted to provide for reflected echoes to be received, amplified and displayed as the velocity of movement within the organism, the improvement comprising a complex signal converter means for converting a received high frequency signal into complex signals by mixing the received high frequency signal with a pair of complex reference signals which have frequencies that are integer multiples of the pulse rate and which are complexly related to one another, an autocorrelator means for determining the autocorrelation of said complex signal, said autocorrelator means having a time delay equal to an integer multiple of the period of the pulse rate, and a velocity determination circuit for determining the velocity utilizing said autocorrelation, whereby the velocity distribution of a moving member in the living organism is measured and displayed.

4,573,478

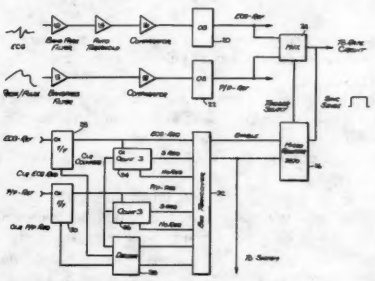
AUTOMATIC PULSE RATE TRIGGER-SOURCE SELECT CIRCUIT

Jeffrey M. Arnold, Ridgewood; James R. Brosnahan, River Edge; Terrence H. Koong, Teaneck; Thomas A. Mans, Harrington Park, and Theodore A. Milo, Teaneck, all of N.J., assignors to Datascope Corporation, New York, N.Y.

Filed Jul. 22, 1983, Ser. No. 516,266

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—670 **4 Claims**



1. An automatic pulse rate trigger-source select circuit, for selecting between trigger pulses corresponding to an ECG heart rate signal source and trigger pulses corresponding to a pressure/pulse heart rate signal source, and for providing the selected trigger pulses as an output signal, comprising:

input means having inputs for being coupled to said original sources for generating said respective trigger pulses;

comparison circuit means, coupled to receive said trigger pulses from said input means, for comparing successive periods between trigger pulses for both of said sources to determine which of said sources is most accurately periodic, wherein said comparison circuit means provides an output instruction signal in correspondence with the said most periodic source, and wherein said comparison circuit means comprises a microprocessor programmed to provide a pair of timer functions for respectively counting up during a first of two successive heart beat periods for each of said sources, and for counting down during the second of said successive periods, and programmed to compare the final counts of said timer functions at the completion of said respective second periods; and

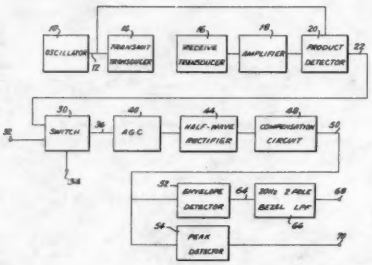
selecting circuit means, coupled to receive said trigger pulses from said input means, and coupled to receive said instruction signal from said comparison circuit means for selecting the trigger pulse corresponding to one of said sources of heart beat signals in response to said output instruction signal, and for providing the selected trigger pulses as an output signal corresponding to the selected source;

wherein said trigger pulses provided as an output signal are selected automatically in correspondence with the most periodic of said sources.

4,573,479
SYSTEMS AND METHODS FOR MONITORING THE FETAL HEART

Mark J. Tuccillo, Southington, Conn., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,735
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—698 13 Claims



1. A method of producing an event signal representative of the recurrence of a fetal heart cycle event comprising the steps of:

supplying an input signal representative of fetal heart motions and corresponding to at least one fetal heart cycle;

sampling portions of the input signal;

deriving a comparison signal from the sampled portions of the input signal;

providing a correlation signal which has peaks and which represents a correlation function in time between sampled portions of the input signal and the comparison signal;

determining whether a fetal heart cycle is represented by one or two successive peaks of the correlation signal; and

producing said event signal in response to said determination.

4,573,480
IMPLANTABLE ELECTRODE LEAD WITH MICROPOROUS INSULATION

Jakub Hirschberg, Täby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

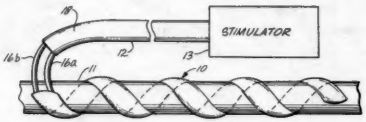
Filed Dec. 19, 1983, Ser. No. 562,756
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305271
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—784 14 Claims

1. An implantable electrode lead of the type having an electrode tip for coupling an electrical stimulator with body tissue to be stimulated through the electrode tip, the implantable electrode lead comprising: a generally helically wound electrical conductor; at least one flexible, cylindrical insulating sleeve for coaxially encapsulating the electrical conductor to provide an insulator; and the insulating sleeve comprises a porous synthetic material that is polytetrafluoroethylene having a predetermined pore size that makes the insulating sleeve highly flexible and bendable while being essentially impervious to body fluids to prevent tissue growth thereon.

4,573,481
IMPLANTABLE ELECTRODE ARRAY

Leo A. Bullara, Glendora, Calif., assignor to Huntington Institute of Applied Research, Pasadena, Calif.

Filed Jun. 25, 1984, Ser. No. 623,981
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—784 19 Claims



1. An electrode assembly for surgical implantation on a nerve of the peripheral nerve system, comprising:

a flexible helically formed supporting matrix of dielectric material;

a flexible conductive electrode secured to the surface of the matrix, the electrode having front and rear surfaces and side edges, the front surface being exposed and not covered by the matrix, the electrode occupying only a portion of the cross-sectional periphery of the matrix; and

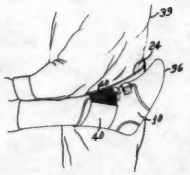
flexible connection means connected to the electrode and extending from the matrix;

the matrix and electrode generally forming a multiturn hollow helix wibh a free end and without a supporting core, the turns being resiliently movable with respect to each other to enable the helix to be wrapped around an unsevered nerve, the helix having a central passage therethrough of size and configuration generally conforming to the external size and configuration of the nerve.

4,573,482
ARTHROSCOPIC SURGERY METHOD

J. Webster Williams, Jr., Jacksonville, Fla., assignor to Arthro-Medic, Inc., Jacksonville, Fla.

Continuation of Ser. No. 394,709, Jul. 2, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,444
Int. Cl.[4] A61F 3/00
U.S. Cl. 128—804 5 Claims



1. In a process in which a surgeon performs arthroscopic surgery on the knee of a patient the improvement which comprises placing around the foot of said patient a boot having means for releasably applying and snugly fastening said boot around the foot and lower leg of the patient whereby rotative movement of said boot will cause twisting of the leg and knee, said boot having a releasable fastener portion on its outside surface, placing around the waist of said surgeon a belt having a waistband with releasable fastening means at the two ends thereof to provide an adjustable snug fit around the surgeon's waist and having connecting means extending laterally of said belt and positioned generally midway between an end of the belt and a point halfway between said two ends, which include a releasable fastener portion adapted to releasably engage said fastener portion on said boot placing the patient's foot encased in said boot in a selected orientation against said belt adjacent one of said connecting means, wrapping said connecting means

around said boot to engage said releasable fastener portions thereof whereby movement of said surgeons waist produces flexure or twisting of said knee.

4,573,483

COMBINE HARVESTERS

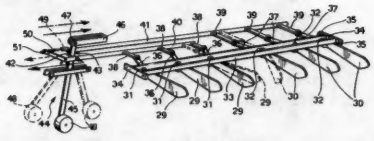
Giuseppe Raineri, Bassano del Grappa, Italy, assignor to Pietro Laverda S.p.A., Breganze, Italy

Filed Jun. 27, 1984, Ser. No. 625,165

Claims priority, application Italy, Nov. 30, 1983, 68257 A/83

Int. Cl.⁴ A01F *12/30*

U.S. Cl. 130—27 AE **3 Claims**



1. A combine harvester comprising:

a threshing unit;

a pair of contra-rotating transverse distributor screws for discharging downwardly produce received from the threshing unit and distributing it over the entire width of the harvester;

a transverse accelerator roller disposed below the two distributor screws to accelerate the fall of the produce;

a substantially vertical, fixed transverse wall located adjacent the accelerator roller and adapted to cooperate with the later to enable the acceleration of the produce;

a cleaning unit disposed below the accelerator roller and including a shaking box with at least two cleaning screens lying one above the other;

means for directing a current of air at the produce accelerated by the accelerator roller and the produce which falls onto the cleaning screens; and

means for deflecting the flow of produce accelerated by the accelerator roller toward the higher side of the harvester when the harvester is tilted sideways;

said deflector means including two series of deflector blades pivoted on a fixed structure of the harvester and extending below said accelerator roller for lateral pivotal movement about substantially vertical axes, each series of blades being disposed on opposite sides of the center of the harvester with each series of blades being moveable independently of the other series of blades, a single pendulum sensor device adapted to detect any lateral tilting of the combine harvester and a mechanical drive interposed between the single pendulum sensor device and each series of deflector blades to effect rotation of the lower series of blades toward the higher sides of the combine harvester while preventing rotation of the higher series of blades when the harvester is tilted sideways.

4,573,484

CHARGING DEVICE FOR OPENING AND DELIVERING LEAF-TYPE MATERIAL

Alfred Rüffer, Cologne; Peter Maubach, Brühl; Johannes Haas, and Horst Quester, both of Cologne, all of Fed. Rep. of Germany, assignors to Wilh. Quester Maschinenfabrik GmbH, Hürth, Fed. Rep. of Germany

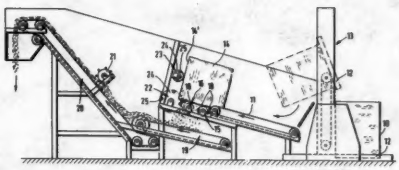
Filed Aug. 20, 1984, Ser. No. 642,445

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 8418005[U]

Int. Cl.⁴ A24B *3/06*

U.S. Cl. 131—327 **18 Claims**

1. A charging device for opening and delivering leaf-type material comprising a conveyor, said conveyor having a discharge end, means for imparting movement to said conveyor to convey leaf-type material in a downstream direction of travel toward said discharge end, at least one means adjacent said discharge end and underneath the leaf-type material for establishing an arcuate path of travel along which a plurality of members move for intermittently successively underengagingly contacting and opening the leaf-type material during the



movement thereof beyond said discharge end, and at least one means downstream of said opening means for establishing an arcuate path of travel along which a plurality of elements move for intermittently successively contacting and stripping, in opposition to the downstream direction of travel, the leaf-type material.

4,573,485

COIN RUNWAY WITH COIN SEQUENCING FACILITY

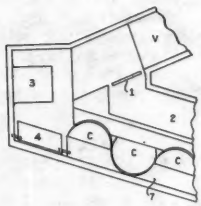
Charles L. Nye, St. Helens, England, assignor to The Plessey Company plc, Ilford, England

Filed Feb. 14, 1983, Ser. No. 466,026

Claims priority, application United Kingdom, Feb. 15, 1982, 8204381

Int. Cl.⁴ G07D *3/00*

U.S. Cl. 133—3 D **7 Claims**



1. A coin runway arrangement for accepting a sequence of coins of varying dimensions, said coin runway arrangement comprising:

coin validating means for allowing passage of select validated coins;

a coin storage section for receiving validated coins from the coin validating means, the coin storage section comprising two separate coin runways extending longitudinally in the same direction at an inclined angle to the horizontal and diagonally oriented at an angle with respect to each other about the centre of the longitudinal axis of each diagonal runway in the form of a cross; and

coin separating means located preceding the coin storage section in the path of the coins for separating validated coins into two distinct groups in accordance with their dimensions, each group including coins of different dimensions from the other group, and each group including coins of different dimensions from each other.

4,573,486

DEVICE FOR CLEANING CONTAINER FILLING MACHINES

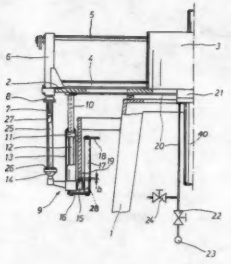
Wilhelm Weiss, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,233

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311800

Int. Cl.[4] B08B *9/00*

U.S. Cl. 134—104 **5 Claims**



5. A canister means adapted to substitute for a bottle in a bottle filling machine during circulation of cleaning fluid through the machine, said machine including filler valves and platform means aligned therewith, means for exerting a continuous upward force on said platform and means for periodically reciprocating said platform means vertically to raise a bottle and lower the bottle to a first lower limit to correspondingly couple and uncouple the bottle and said filler, said reciprocating means being operative when said platform is free to move between lower and upper limits,

said canister means comprising a pipe element having an axial length greater than the height of said bottle for being interposed between said platform and filler valve when said force is temporarily removed so that said platform means is at a second lower limit and lower than said first lower limit, restoration of said force causing said canister on the platform to couple in pressure relation with said filler valve and said platform to move to a position between said second and first lower limits at which position said reciprocating means becomes disabled.

4,573,487

UMBRELLA FRAME WITH SLIDER RELEASE MECHANISM

Tilmann Schultes, Solingen, and Klaus Stiller, Langenfeld, both of Fed. Rep. of Germany, assignors to Kortenbach & Rauh Kommanditgesellshaft, Solingen, Fed. Rep. of Germany

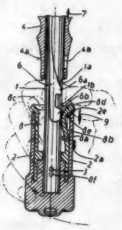
Filed Nov. 23, 1984, Ser. No. 674,323

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345725

Int. Cl.[4] A45B *25/14, 25/08*

U.S. Cl. 135—24 **6 Claims**

1. In an umbrella frame comprising a stick, a handle fixed to said stick, a slider slidable along said stick, a locking member arranged to lock said slider relative to said stick, and a trigger sleeve carried by said handle and arranged to have an operative axial movement relative to said stick from a first position to a second position, said trigger sleeve cooperating with said locking member whereby said operative axial movement of said trigger sleeve operates said locking member and thereby releases said slider for sliding movement on said stick; the improvement comprising: a pair of manually operated, integrated trigger means consisting of said axially movable trigger sleeve comprising a primary trigger and a radially, inwardly-operated spring element on said primary trigger which comprises a secondary trigger, said primary and secondary triggers projecting from said umbrella handle in a position adjacent said locking member, said secondary trigger being manually-displacable to engage and operate said locking member independently of said primary trigger being located to move radially to engage and operate said locking member, said radial movement resulting from said secondary trigger operative axial movement of said primary trigger.



4,573,488

ADDITIVES FOR NONAQUEOUS LIQUIDS

Donna B. Carville, Plaquemine; Edwin R. Feig, Baton Rouge; Gene D. Rose, Midland, and Mary H. Pulliam, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 12, 1984, Ser. No. 599,317

Int. Cl.[4] C09K *3/00;* **F17D** *1/16, 1/18*

U.S. Cl. 137—13 **24 Claims**

1. A process for reducing the friction loss in nonaqueous liquids flowing through conduits comprising adding to the nonaqueous liquid an amount effective to reduce friction of a homopolymer of butylene oxide or a copolymer comprising butylene oxide and a $C_{2\text{-}25}$ vicinal epoxide wherein the homopolymer or copolymer has a molecular weight from about 1 million to about 10 million amu.

4,573,489

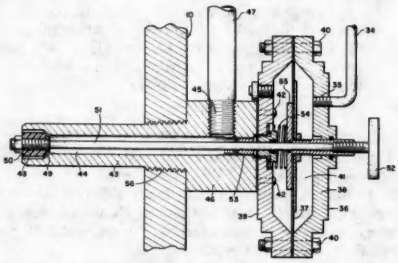
DUMP VALVE

Lewis M. Carlton, Tulsa; Bob L. O'Mary, Claremore, and Teddy H. Cruse, Broken Arrow, all of Okla., assignors to Murphy Management, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 586,838, Mar. 6, 1984, Pat. No. 4,505,288. This application Dec. 12, 1984, Ser. No. 680,896

Int. Cl.[4] E03B *7/12;* **F16K** *31/145, 33/00*

U.S. Cl. 137—59 **4 Claims**



1. A dump valve for dumping liquid from the bottom of a tank comprising an elongated valve body insertble into the lower end of said tank so that said valve body extends deeply into said tank to prevent freezing of the liquid within the valve, the innermost portion of said valve body having an inner port communicating with the interior of said tank, said valve body

having a portion extending exterior of said tank when said body is inserted into said tank, said valve body having a central axial bore extending therethrough and communicating with the inner port for directing liquid away from said tank, a drain passage connected to the exterior portion of said valve body and communicating with the axial bore for draining liquid from the tank, a pair of head plates connected to the exterior portion of said valve body, said head plates being connected to each other and forming a diaphragm chamber therebetween, a diaphragm held in sealed clamping engagement between the head plates and dividing the chamber into two separate compartments sealed from each other, an elongated valve stem extending within said axial bore from an inner end adjacent said inner port to an outer end which extends through one of said plates and is connected to said diaphragm, a valve closure element mounted on the inner end of said valve stem and adapted to seat in said inner port to close the same, and a pressure conduit connected to one of said compartments for exerting pressure against said diaphragm to move said stem axially to open said inner port to drain liquid from said tank in response to a liquid level condition.

4,573,490

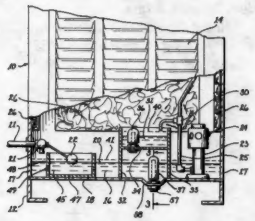
APPARATUS FOR THE AUTOMATIC PURGING OF THE RESERVOIR IN A WATER RECIRCULATION SYSTEM

Robert B. Kaletsky, 2009 N. 46th St., Phoenix, Ariz. 85008

Filed Mar. 19, 1984, Ser. No. 591,042

Int. Cl.⁴ F04F *10/00*

U.S. Cl. 137—124 **7 Claims**



1. Automatic purge apparatus for a fluid recirculation system containing fluid utilization means which comprises:

(a) a primary reservoir having input and output ports;

(b) fluid regulating means for controlling entry of fluid through said input port;

(c) pump means located in fluid communication with the primary reservoir, the actuation of the pump means initiating the circulation of fluid through the system;

(d) a secondary reservoir for receiving a portion of the fluid circulating through said system;

(e) diversion means in fluid communication with said pump means for diverting a portion of the fluid therefrom to the secondary reservoir;

(f) primary relief means located at the output port of the primary reservoir, said primary relief means purging the primary reservoir when the fluid therein reaches a first level; and

(g) secondary relief means mounted in the secondary reservoir for removing fluid therefrom when said fluid reaches a predetermined level, said relief means directing at least a portion of the contents of the secondary reservoir into said primary reservoir.

4,573,491

TUBE SEPARATOR

Hans Arens, Wertingen; Hans Kern, Vachendorf, and Richard Haslberger, Hufschlag, all of Fed. Rep. of Germany, assignors to Grunbeck Wasseraufbereitung GmbH, Hochstadt, Fed. Rep. of Germany

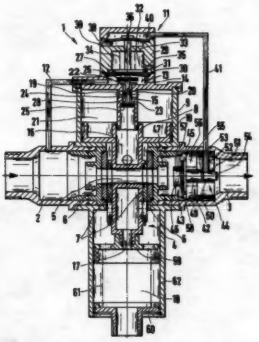
PCT No. PCT/EP83/00338, § 371 Date Aug. 14, 1984, § 102(e) Date Aug. 14, 1984, PCT Pub. No. WO84/02544, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 15, 1983, Ser. No. 640,765

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247325

Int. Cl.⁴ E03C *1/10*

U.S. Cl. 137—218 **11 Claims**



1. A tube separator comprising

a housing having an inlet side and an outlet side,

shut-off means connecting said inlet side with said outlet side in a first position and separating said inlet side from said outlet side in a second position,

pilot valve means having a first inlet connected with said inlet side and a second inlet connected with said outlet side and connecting said shut-off means with said inlet side in a first switching position and with a chamber having a pressure which is smaller than a predetermined pressure of the medium at the inlet side in a second switching position as a function of the difference of the pressure at said first and second inlet,

and valve means provided between said second inlet and said outlet side for releasing the connection between said second inlet and said outlet side only if the flow pressure of the medium passing through said tube separator in said first position of said shut-off means falls below a predetermined pressure.

4,573,492

DISCHARGE CONTROL VALVE

Yoshiharu Tadokoro, Sakai, Japan, assignor to Kurimoto, Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 632,773

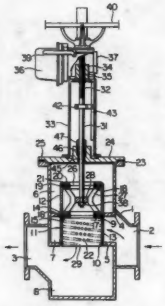
Claims priority, application Japan, Aug. 12, 1983, 58-125110

Int. Cl.⁴ F16K *1/44, 11/07*

U.S. Cl. 137—239 **5 Claims**

1. A discharge control valve, comprising: a valve casing which has an inlet port on one side and an outlet port on the other side and has means defining a chamber therein, said casing having upper and lower partition walls which extend horizontally across said chamber with a fixed vertical distance therebetween and divide said chamber into an upper chamber located above said upper partition wall, an inlet chamber located between said partition walls and in fluid communication with said inlet port, and an outlet chamber located below said lower partition wall and in fluid communication with said

outlet port; and a cylindrical valve body having upper and lower ends and having a passageway which extends between and opens through said upper and lower ends, said valve body being axially slidable in first and second passage holes which are respectively provided in said upper and lower partition walls and which each have an annular surface adapted to slidably engage a cylindrical peripheral surface of said valve body, said valve body having an elongate, axially extending valve shaft which extends slidably and sealingly through an opening provided in a top wall portion of said valve casing at an upper end of said upper chamber, a lower portion of said valve body being a discharge control portion having a plurality of small holes in its peripheral surface which communicate with said passageway therethrough, and an upper portion of said valve body being a shutter portion having a peripheral



wall which is free of openings therethrough; wherein when a lower end of said discharge control portion is axially aligned with said second passage hole a middle portion of said valve body between said shutter portion and said discharge control portion is axially aligned with said first passage hole; wherein when an upper end of said shutter portion is axially aligned with said first passage hole said middle portion is axially aligned with said second passage hole; wherein when said lower end of said valve body is engaging a bottom wall portion of said casing at a lower end of said outlet chamber said upper end thereof is within said inlet chamber at a location spaced below said upper partition wall; and wherein when said upper end of said valve body is engaging said top wall portion of said casing said lower end of said valve body is within said inlet chamber at a location spaced above said lower partition wall.

4,573,493

SEQUENTIALLY CONTROLLED WATER MIXER

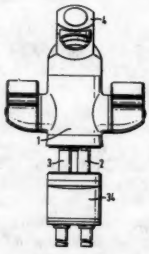
Gösta Hammarstedt, Alstermo, Sweden, assignor to Arcu Armaturindustri AB, Alstermo, Sweden

Filed Mar. 13, 1984, Ser. No. 589,016

Claims priority, application Switzerland, Mar. 17, 1983, 1470/83

Int. Cl.⁴ F16K *43/00, 37/00, 19/00*

U.S. Cl. 137—315 **7 Claims**



1. A sequentially controlled water mixer comprising a valve housing with a cold water inlet connection on one side of the mixer, a hot water inlet connection on another side of the mixer, and a common outlet, said housing defining a mixing chamber between the inlet connections and said outlet and a regulating chamber located on the inlet side of the mixing chamber, and a rotationally adjustable regulating switching valve housed in the regulating chamber and having regulating apertures, said valve being manually adjustable by at least one operating member which can be set relative to said switching valve to control flow through the connections via said apertures, the inlet connections defining recessed holes which are of larger dimension than respective cold and hot inlet pipes to be connected therewith, a compression spring and a seal in each hole, a sealing surface of the seal being pressed by the spring into contact with said switching valve, said sealing surface following the contour of said switching valve, said seal defining a through hole for said inlet connection and peripheral holes for retaining a lubricant inserted therein, and a connecting device into which the inlet connections, in the form of short lengths of pipe, can be inserted, sealing means being provided for sealing the inlet connections with the connecting device, the valve housing defining an aperture which accommodates a respective axial pin, and further comprising a gland provided with an external O-ring and external position indicators corresponding to internal position indicators in said aperture, stops are provided on the inner surface of the gland, one for an open position and one for a closed position, said stops comprising stop projections in the bore of said at least one operating member, and a means projecting from the bore for coacting with an indicator tab projecting from the inner surface of said gland between the stops to indicate valve positions.

4,573,494

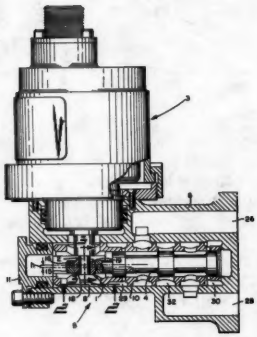
SPHERICAL BALL DRIVE MECHANISM FOR A DIRECT DRIVE VALVE

Kenneth C. Spurbeck, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Jan. 28, 1985, Ser. No. 695,700

Int. Cl.⁴ F16K *31/52*

U.S. Cl. 137—331 **11 Claims**



1. In combination, a linear valve member and a rotary force motor, and a spherical ball drive mechanism for directly coupling said rotary force motor to said valve member, said spherical ball drive mechanism comprising a spherical bearing assembly attached to said valve member, said spherical bearing assembly comprising an outer race member having a concave spherical inner bearing surface, said outer race member having a longitudinal axis substantially perpendicular to the longitudinal axis of said valve member and a transverse center axis radially offset from the longitudinal axis of said valve member, and a spherical bearing member received in said outer race

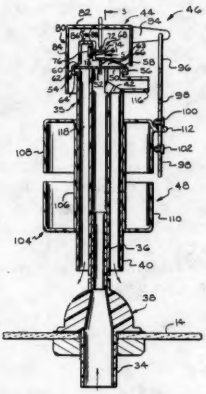
member, said spherical bearing member having a convex spherical outer bearing surface complementary to the concave spherical inner bearing surface of said outer race member, and said rotary force motor having an eccentric output shaft extending substantially perpendicular to the longitudinal axis of said valve member for connection to said spherical bearing member.

4,573,495

HYDROSTATIC BALLCOCK ASSEMBLY

Charles T. Rothe, Locust St., Providence, Ky. 42450, and Larry D. Gish, Rte. 2, Box 150A, Robards, Ky. 42452

Filed Nov. 21, 1984, Ser. No. 673,980
Int. Cl.[4] F16K *31/34, 33/00*
U.S. Cl. 137—414 **10 Claims**



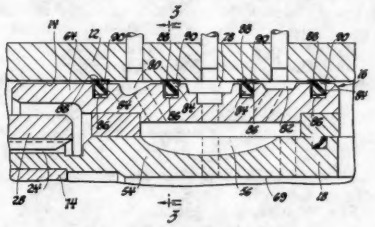
1. In a ballcock assembly having an upright standpipe for delivering flush water, said standpipe having an upper discharge end, a control valve assembly for controlling the flow of water from the standpipe, said control valve assembly comprising a housing having an annular bottom wall which extends about said standpipe upper end and a top wall having a water discharge opening, a diaphragm valve member supported at its radially outer edge on said housing bottom wall, said valve member cooperating with said housing top wall to form a vent valve chamber therebetween in said housing, said valve member having an opening therein enabling water to flow into said vent valve chamber from said standpipe, a vent valve member in said chamber movable between a closed position closing said top wall water discharge opening and an open position enabling flow of water out of said chamber through said discharge opening, said vent valve member comprising a seat located in said valve chamber and a stem extending outwardly through said opening in said housing top wall, actuator means movably mounted on said housing in a spaced relation with said vent valve member and engageable with said stem, a portion of said actuator means being adjustable at various points along the length of said stem to vary the magnitude of the valve opening force applied to said stem when said vent valve member is moved to an open position, and float means operatively associated with said vent valve member and operable to provide for movement of said actuator means on said housing into engagement with said stem to move said vent valve member from closed to open position, said vent valve member operating in the closed position to provide for movement of said diaphragm member to a position closing the discharge end of said standpipe and in the open position to provide for movement of said diaphragm member to a position opening the discharge end of said standpipe.

4,573,496

HYDRAULIC POWER STEERING GEAR AND ROTARY VALVE THEREFOR

Dennis J. Richard, Linwood, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1984, Ser. No. 601,499
Int. Cl.[4] F16K *11/12, 11/085;* F16J *9/24*
U.S. Cl. 137—625.21 **6 Claims**



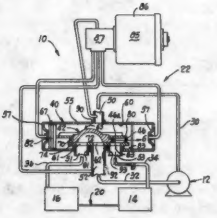
1. A power steering gear for a vehicle comprising a metallic housing having a smooth wall cylindrical bore formed therein, said housing having hydraulic inlet and outlet ports for operative connection to a hydraulic pump and to a sump for the hydraulic pump, said housing having a plurality of fluid passages extending through the wall of said housing to the bore therein, a rotary valve assembly rotatably mounted in said bore for supplying fluid pressure to said fluid passages, a rotatable steering gear input, said rotary valve assembly comprising a valve spool operatively connected to said steering gear input and a cylindrical valve body operatively mounted on said valve spool and within said valve bore, said valve body having a plurality of laterally spaced annular seals rotatably mounted on the outer periphery of said valve body and discrete texturized gripping surface means on the wall of said bore for directly contacting the outer periphery of said seals to inhibit said seals from rotating relative to said bore and so that said seals will rotate relative to said valve body to thereby reduce wear of cylindrical wall of said bore by said seals as said input is rotated.

4,573,497

REFRIGERANT REVERSING VALVE

Lee A. White, Marysville, Ohio, assignor to Ranco Incorporated, Dublin, Ohio

Filed Aug. 23, 1984, Ser. No. 643,475
Int. Cl.[4] F16K *31/122*
U.S. Cl. 137—625.29 **19 Claims**



1. A refrigerant flow reversing valve comprising:

(a) a tubular valve body defining a first port for communicating with the discharge of a refrigerant compressor, a second port for communicating with the compressor inlet and third and fourth ports for communicating with heat exchangers in the refrigeration system;

(b) a valving member supported by said body for movement

with respect to said ports so that in a first position of said valving member refrigerant flows through said valve from said first port to said third port and from said fourth port to second port and in a second valve member position refrigerant flows from said first port through said fourth port and from said third port through said second port;

(c) refrigerant flow tubes hermetically fixed to said reversing valve body and respectively associated with said ports for directing refrigerant flows through said valve from the refrigeration system said flow directing tubes; and,

(d) heat transfer blocking means immediately adjacent said valve body for minimizing heat flow between said valve body and refrigerant in the flow tubes associated with said second, third and fourth flow tubes adjacent said valve body.

4,573,498

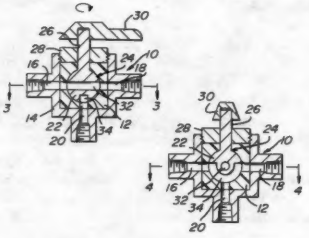
BALL VALVE

Albert R. Ludwig, Holiday, Fla., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 29, 1984, Ser. No. 594,646

Int. Cl.⁴ F16K *11/087, 5/20*

U.S. Cl. 137—625.47 **3 Claims**



2. A ball valve comprising:

a valve body having an inlet port and outlet port of the same diameter and aligned along the same axis and a drain port aligned along an axis normal to that of said inlet and outlet ports; and

a ball stem having a ball end and a stem end, said ball stem being mounted in said valve body for rotation therein about its axis, said stem axis being aligned with the axis of said drain port with the stem extending from the valve body 180° from the drain port, and the ball end of said stem having

a through hole of the same diameter as said inlet and outlet ports and aligned with said ports when said stem is in a first rotational position to provide unrestricted flow between said inlet and outlet ports,

a slot extending over 180° of the periphery of said ball end in a plane normal to the axis of said through hole, said slot providing drainage from both the inlet and outlet ports through the drain port when said stem is in a second rotational position 90° from said first rotational position.

4,573,499

WEFT DETECTION STOPPER FOR LOOMS

Katsuhiko Sugita, Kanazawa, Japan, and Makoto Uehara, Charlotte, N.C., assignors to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Mar. 27, 1984, Ser. No. 593,817

Claims priority, application Japan, Apr. 1, 1983, 58-058297

Int. Cl.⁴ D03D *51/34*

U.S. Cl. 139—370.2 **9 Claims**

7. An apparatus for controlling the operation of a loom in response to the detection of weft defects, comprising:

a plurality of weft detection units arranged side-by-side on a loom along the path of weft travel for producing a plurality of defect signals each representative of a weft defect in a cloth being woven;

means for generating a plurality of mend signals each representative of the correction of a weft defect in the cloth being woven;

a reversible counter having an up-terminal connected to said weft detection units for accumulation of said defect signals, and a down-terminal connected to said means for generating a plurality of mend signals for subtracting said mend signals from said accumulation, said counter generating a stop signal when said accumulation exceeds a threshold value; and

a loom stop circuit responsive to said reversible counter for controlling the operation of the loom.

4,573,500

FLAME-RESISTANT FABRICS

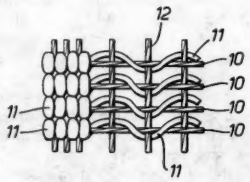
Allan B. Douglas, Hawick, Scotland, assignor to British Replin Limited, Ayr, Scotland

Filed Jun. 12, 1984, Ser. No. 619,912

Claims priority, application United Kingdom, Jun. 14, 1983, 8316172

Int. Cl.⁴ D03D *15/12, 23/00*

U.S. Cl. 139—426 R **2 Claims**



1. A single-layer woven fire-resistant furnishing fabric comprising:

standing warps of a fire-resistant yarn,

a covering warp of a wear-resistant yarn cross-woven on each standing warp,

wefts of a fire-resistant yarn binding the covering warps on one side only of the standing warps,

a ribbed wear-resistant outer surface to the fabric formed by the beating-up to the fell of the covering warps and the wefts, after each pick, and

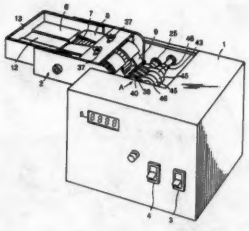
a fire-resistant grid formed by the standing warps and the wefts, after said beating-up, said fire-resistant grid not being exposed on said ribbed wear-resistant outer surface until said covering warps are removed by fire.

4,573,501

APPARATUS FOR CUTTING AND FORMING LEADS

Harumi Furuya, Tokyo, Japan, assignor to Henry Mann, Inc., Huntingdon Valley, Pa.

Continuation-in-part of Ser. No. 522,064, Aug. 10, 1983, abandoned. This application Aug. 30, 1984, Ser. No. 645,944
Claims priority, application Japan, Oct. 30, 1982, 57-191178
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 10 Claims



1. An apparatus for cutting and forming part leads comprising a feeder, a cutter, a former, and a hopper,

said hopper including a receiver, a belt conveyor arranged adjacent to said receiver and operated by a driven belt wheel, a pair of covers each of which has a guide portion and a straight portion, said covers being disposed above the belt conveyor in such a manner that the distance between said covers can be adjusted according to the length of the part body of the parts to be handled, and a pair of guides located in the proximity of said belt conveyor and spaced wider apart than the width of said belt conveyor

said feeder including a pair of feed wheels having peripheral teeth at a predetermined pitch and spaced apart the same distance as said straight portions of said covers and mounted on a shaft, so as to be shifted in position relative to each other, and a similar pair of outer feed wheels shiftably mounted on the same shaft on the outer sides of said feed wheels and at distances where the leads connected to each part body are to be cut,

said cutter including a pair of guide holders shiftably mounted on a shaft generally in alignment with, and close to, said outer feed wheels, and cutting blades installed on the inner sides of said guide holders, with their edges extended beyond the dedendum circles of said outer feed wheels, and

said former including a pair of bender holders shiftably mounted on said cutter shaft generally in alignment with, and close to, said feed wheels, and a pair of benders mounted on said same shaft on the outer sides of said bender holders, each said bender being provided with a leaf spring which is wide enough to cover at least the periphery of the associated feed wheel, from the dedendum circle to the tooth tops thereof, so as to bend and form each lead in each tooth space of said feed wheel with the revolution of said wheel.

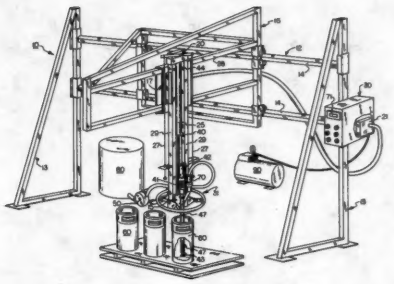
4,573,502

CONTAINER FILLING APPARATUS AND METHOD

Byron H. Hurley, Julian, and Walter G. Ricks, Pleasant Garden, both of N.C., assignors to Byron H. Hurley, Pleasant Garden, N.C.

Filed Oct. 9, 1984, Ser. No. 658,669
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—1 11 Claims

7. A method of filling a container with liquid comprising: positioning filling means over a container, manually activating a switch, setting brake means while lowering said filling means into the container, directing liquid into the container from the filling means, sending a pulse to a counter while directing the



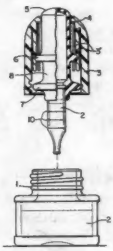
liquid into the container and raising said filling means while directing the liquid into the container.

4,573,503

INK DROPPER CLOSURE

Bernhard Bruhn, Halstenbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Sep. 28, 1984, Ser. No. 655,604
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1983, 8329184[U]
Int. Cl.[4] B65B *3/12*
U.S. Cl. 141—24 7 Claims



1. In a container having a closure element further comprising an axially extending dropper, characterized by a suction element joined to the closure element and comprised of an elastically deformable material, accessible from outside of the closure element proximate its posterior region, and communicating to a suction tube at its anterior end, the improvement which comprises a sealing element means extending transversely from the suction element at an axial location that is anterior to a location where the suction element is joined to the closure element, and adapted to seal against the upper rim of said container opening, wherein said suction element further comprises a section adapted elastically to be deformed and shortened from its normal length in the axial direction thereby to define a volume decrease within said suction element, wherein further said deformable section (8) extends between said sealing means (7) and a connecting means (6) for said joining of the suction element to the closure element (3) and preventing axial motion therebetween, whereby, when the closure element (3) is axially moved into a sealing position upon the container (1), the axial length of said section is made shorter, and the suction element volume decreases in order to create a reproducible suction effect at the anterior end of the suction tube as the closure element (3) axially is removed out of contact with the container (1).

4,573,504

EQUIPMENT FOR THE REMOVAL OF AIR OUT OF PULVERULENT MATERIALS

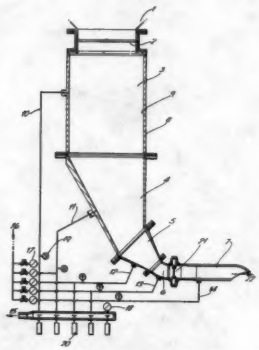
Pertti Rosenström, Kyminlinna, Finland, assignor to Erkomat Oy, Kotka, Finland

Filed May 11, 1984. Ser. No. 609,130

Claims priority, application Finland, May 11, 1983, 831654

Int. Cl.⁴ B65B *1/04*

U.S. Cl. 141—59 **4 Claims**



1. Equipment for the removal of air from pulverulent materials before the product is packaged or transferred, said equipment comprising a storage container out of which the pulverulent material to be packaged flows readily into a packaging vessel placed underneath, a porous face of lining material being provided at a distance from a gas tight exterior wall of the packaging vessel substantially over the entire length of the packaging vessel, said lining material, permitting either removal of air from the packaging vessel or feeding pressurized air into the packaging vessel through the space between the exterior wall of the packaging vessel and said porous face of the lining material the space between the exterior wall of the packaging vessel and the face of the lining material being divided air-tightly, in the direction of progress of the pulverulent material, by partition walls into at least two compartments separate from each other, means for individually, selectively connecting a suction or a pressure of a desired magnitude to each of said compartments independently from each other.

4,573,505

CONTAINER WASHING AND FILLING MACHINE

Graham L. Lee; Jeffrey R. Shuttlewood, both of Kent, and John W. Ambrose, Rainham, all of United Kingdom, assignors to APV Burnett & Rolfe Ltd., Rochester, England

Filed Apr. 13, 1984, Ser. No. 600,285

Claims priority, application United Kingdom, Apr. 20, 1983, 8310665

Int. Cl.⁴ B65B *3/04*; B67C *3/26*

U.S. Cl. 141—92 **20 Claims**

15. A container washing and filling machine for washing and filling blow moulded containers having an open-ended neck surrounded by a collar, said machine including: only a single head through which both washing and filling liquids are introduced into said container through its said open-ended neck;

means to supply a washing liquid to said single head;

means to supply filling liquid to said single head;

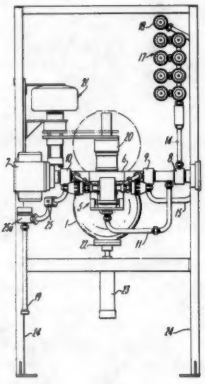
a clamping device arranged to engage and hold said open-ended neck of said container in fluid-tight sealing engagement with said single head; and,

moving means to move said single head and said clamping device together with said container being treated between a washing position wherein said container is inverted and a filling position wherein said container is erect, said fluid-tight sealing engagement between said single head and said open-ended neck of said container being maintained during said movement;

said clamping device comprising a movable body;

a fluid pressure operated ram, said fluid pressure operated ram acting between said body and said single head to move said body with respect to said head;

at least two claws, said claws being pivotally connected to said movable body;



and fulcrum means, said fulcrum means engaging said claws whereby downwards movement of said body caused by said ram carries said claws downwards and reaction from said fulcrum means closes said claws behind said collar on said neck of said container, further downwards movement of said body caused by said ram causing engagement of said claws with said collar and urging said container downwards to move said open ended neck of said container into fluid-tight sealing engagement with said single head.

4,573,506

TWO-BOTTLE ASSEMBLY FOR PREPARING AND DISPENSING A SOLUTION

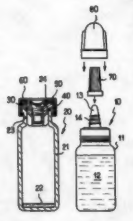
Jean-Claude Paoletti, Volvic, France, assignor to Laboratories Merck Sharp & Dohme - Chibret, Paris, France

Filed Sep. 17, 1984, Ser. No. 651,019

Claims priority, application France, Sep. 26, 1983, 83 15249

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—98 **10 Claims**



1. An assembly for preparing and dispensing a solution obtained from two components of which at least one is liquid, wherein it comprises:

a first bottle containing the first liquid component, of which the neck terminates in an elongated head traversed by a longitudinal conduit placing the interior of the bottle in communication with the outside,

a second bottle containing the second component, liquid or solid,

a stopper for this second bottle, presenting on its outer face a recess whose shape is homologous of that of the head of the first bottle, and of which the bottom is separated from the interior of the second bottle only by a thin membrane of elastically deformable material,

this membrane further having an axial orifice passing therethrough, which is hermetically closed, in the absence of deformation of the membrane, by the natural radial constriction of the material constituting the membrane,

the penetration of the head of the first bottle into the recess of the stopper producing an axial deformation of the membrane and a radial distension of the orifice opening a passage for a liquid through the membrane, so that this passage allows a transfer of liquid from one bottle into the other after these two bottles have been joined together,

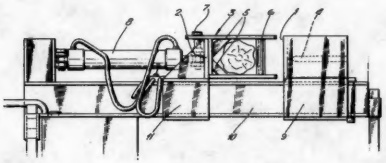
means further being provided to produce a differential pressure between the atmospheres of the two bottles to force the transfer, into the second bottle, of the liquid contained in the first bottle.

4,573,507

DEVICE FOR SPLITTING AND CUTTING OF FIREWOOD

Jahn Harboe, Tistedal, Norway, assignor to Saugbruksforeningen, Halden, Norway

Filed Sep. 17, 1984, Ser. No. 651,137
Claims priority, application Norway, Sep. 16, 1983, 833345
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A **1 Claim**



1. A device for splitting and cutting firewood, comprising:

(a) an elongate horizontal frame member (10),

(b) a vertical knife (1) fixed in relation to the frame member and upstanding therefrom,

(c) at least one horizontal knife (4) fixed to a side of the vertical knife and outstanding therefrom,

(d) an abutment plate (2) slidably disposed on the frame member and extending transversely thereto,

(e) a hydraulic piston and cylinder unit (8) coupled to the abutment plate for displacing said plate toward and away from the vertical and horizontal knives, and

(f) a clamping member (3) removably mounted to the abutment plate for displacement therewith and including:

(1) a pair of vertically oriented knives (5) arranged one above the other and having edges defining a V-shaped recess, and

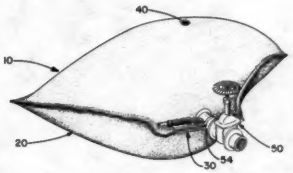
(2) a vertically oriented guide plate (6) spaced from the recess and defining therewith a log receiving opening, whereby logs may be split by displacing the abutment plate towards the vertical and horizontal knives with the clamping member removed, or simultaneously cut and split by inserting a log to a desired length through the receiving opening of the clamping member and displacing the abutment plate and clamping member towards the vertical and horizontal knives.

4,573,508

COLLAPSIBLE STORAGE TANK

Ernest Knaus, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 4, 1985, Ser. No. 719,842
Int. Cl.[4] B65D *88/16, 90/02, 90/08*
U.S. Cl. 150—55 **8 Claims**



1. A flexible and collapsible storage tank for holding large volumes of material comprising in combination:

a substantially homogeneous rectangular tank body comprised of integrally vulcanized inner and outer envelope structures of rubberized square-woven fabric, the inner envelope structure formed by a plurality of long lengths of fabric having overlapping adjacent edges and oriented longitudinally while the outer envelope structure is formed by a plurality of edge plies of fabric folded about the peripheral edges of inner envelope structure and a plurality of lengths of fabric having overlapping adjacent edges and oriented orthogonally on either side of the inner envelope structure;

a vent valve mounted in the top of the tank body to communicate air into and out of the interior thereof when filling and emptying the tank body; and

closure means mounted at one end and across a corner exposure of the tank body to seal the corner exposure and provide a connection for communication into the tank body.

4,573,509

RUN FLAT DEVICE

William T. Smith; Timothy M. Rooney, both of Uniontown, and George T. Watts, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 507,836, Jun. 23, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,475
Int. Cl.[4] B60C *17/06*
U.S. Cl. 152—158 **5 Claims**

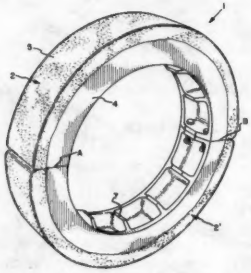
1. An assembly of a multi-piece rim, a tire, and a run flat device comprising:

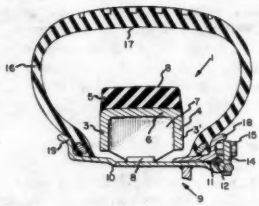
(a) a multi-piece rim comprising an annular rim base having a flange extending radially outwardly from one axial end and a pair of circumferentially extending grooves in said rim base near its other axial end, a movable flange slideably mounted around said rim base, an O-ring having a portion of its mass disposed within the axially innermost groove of said pair of circumferentially extending grooves in said rim base, said O-ring being compressedly secured in place between the rim base and the movable flange, and a lock ring having a portion of its mass disposed in the axially outermost groove of said pair of circumferentially extending grooves in said rim base, said lock ring having at least one surface that is contiguous with said movable flange;

(b) a tubeless pneumatic tire mounted upon said rim, said tire having a pair of bead portions with one bead portion disposed adjacent to the flange of said rim base and the other bead portion adjacent to said movable flange; and

(c) an annular ring-shaped run flat device comprising a rigid radially inner ring and a resilient radially outer ring, said rings comprising a plurality of arcuate sections, each section comprising a radially inner rigid portion having a squared horseshoe-shaped cross section and containing radial rein-

forcements that are adjacent to the rim base with the open side of said horseshoe-shape facing radially inwardly, the radially inner extremities of each rigid portion being positioned near said rim base but axially spaced apart from the bead portions of said tire, each arcuate section further comprising a radially outer resilient portion having a radially





inner surface fastened to a radially outer surface of said rigid portion, the radially inner surface of said resilient portion having the same width as the radially outer surface of said rigid portion, and said run flat device having a height that is 25 to 55 percent of the tire section height while the height of the rigid inner ring is 20 to 80 percent of the height of the run flat device.

4,573,510

TIRE FOR HEAVY LOADS

Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

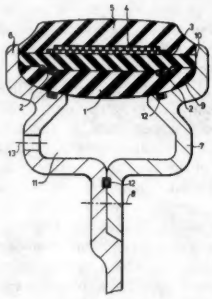
Continuation of Ser. No. 97,534, Nov. 26, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,498

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851765

Int. Cl.[4] B60C *7/12*

U.S. Cl. 152—159 **2 Claims**

1. A tire for heavy loads, the tire comprising a metal felloe having a pair of sides opposing each other across an air space, a ring member having a plurality of rubber layers, a breaker strip and wire cores, the ring being a generally flat ring having a width and a maximum height of which the width is at least twice the maximum height, the flat ring having outer edges held by the opposing sides of the metal felloe, and wherein the ring member is supported intermediate said outer edges by air contained in the air space enclosed by the ring member and the



metal felloe, and the breaker strip and wire cores at least partially overlapping in radial projection.

4,573,511

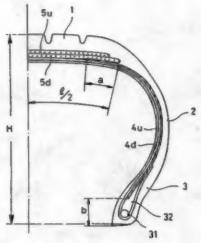
PNEUMATIC TIRE

Kazuyuki Kabe, and Tuneo Morikawa, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,821

Int. Cl.[4] B60C *9/06*

U.S. Cl. 152—548 **4 Claims**



1. In a pneumatic tire having right and left bead wires, right and left side wall portions and a tread portion between the side wall portions and in which two belt reinforcing layers each containing reinforcing cords are laid over each other so that the cords cross each other at an angle of 15° to 30° with respect to the circumferential direction of the tire and in which the belt reinforcing layers are laid over a carcass cord layer in the tread portion of the tire, the improvement wherein said carcass cord layer consists of upper and lower layers; said lower carcass cord layer being a continuous layer that extends in the widthways direction of the tire so that each of its ends is turned up around one of the pair of right and left bead wires, respectively; said upper carcass cord layer being separated into two parts; the edge portions of said upper carcass cord layer parts nearer said tread portion overlaping said belt reinforcing layer to a width of at least 10 mm but less than 0.4 of the width of the belt reinforcing layers, while the edge portions thereof nearer said bead portions are separated from said bead wires but not by more than a height of 0.3 of the cross-sectional height of the tire measured from the bead portion; and in which the reinforcing cords forming said upper and lower carcass cord layers are arranged so that the mean value $[\frac{1}{2}(\alpha_1+\alpha_2)]$ of the angle α_2 of the reinforcing cords in the upper carcass cord layer and the angle α_1 of the reinforcing cords in the lower carcass cord layer is between 95° to 120°, and the difference $(\alpha_2-\alpha_1)$ is between 10° to 60°, the angles α_1,α_2 being measured with

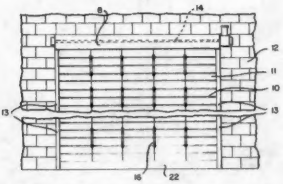
respect to the circumferential direction of the tire and from the side of the tire at which the angle of the reinforcing cords in the belt reinforcing layer adjacent to the upper carcass cord layer is at an acute angle with respect to the circumferential direction of the tire.

4,573,512

LOCKS FOR ARTICULATED ROLLING GRILLES

Dale Lichy, 4651 Sylvan Dr., Allison Park, Pa. 15101

Filed Jul. 27, 1984, Ser. No. 635,286
Int. Cl.[4] E05C *3/02;* E06B *9/08*
U.S. Cl. 160—133 **12 Claims**



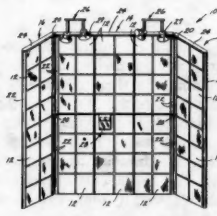
1. An automatic lock structure for articulated rolling grilles and like structures to be rolled up at one end for unbarring an opening comprising an articulated rolling closure for said opening, a shaft at one end of said opening connected to one end of said rolling closure for rolling the same around said shaft for opening the closure, a guide slot structure on opposite sides of said opening transverse to said shaft, said guide slot structure receiving and concealing opposite side edges of said rolling closure, at least one lock abutment means on at least one guide slot structure, at least two generally parallel spaced rods extending across the opening between said opposite guide slots, at least one first lift link connecting said at least two parallel rods at each end within the guide slots, a second lift link at each end of a parallel rod an elongate hole in one end of one of said lift links receiving the parallel rod more remote from said shaft, a guide member intermediate the ends of said at least one first lift link and parallel to said at least two parallel rods, a locking link means parallel to said at least one lift link and movable relative to the parallel rod more remote from said shaft whereby when the rod more remote from said shaft and a rod less remote from the shaft are moved relatively closer together the locking link means is urged outwardly by the guide member into locking engagement with the lock abutment means.

4,573,513

MODULAR PANEL CONSTRUCTION

Marc J. Small, Perrysburg, and David E. Powers, Toledo, both of Ohio, assignors to Good Displays, Inc., Toledo, Ohio

Filed May 2, 1983, Ser. No. 490,784
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—135 **1 Claim**



1. A modular panel construction comprising:

a plurality of rectangular modular panel sections each having upper, side, and lower marginal edges, each of said panel sections provided with at least two individual, substantially identically shaped rectangular panels securely and rigidly attached thereto and having parallel adjacent marginal edges spaced apart from one another by a predetermined distance defining a significant gap therebetween;

said plurality of panel sections including a first panel section having a side marginal edge connected to a side marginal edge of an adjacent second panel section, means for releasably interconnecting the adjacent side marginal edges of said first and second sections, said interconnecting means including means for maintaining the side marginal edge of the rectangular panels of said first panel section spaced from the side marginal edge of the adjacent rectangular panels of said adjacent second panel section by said predetermined distance; and

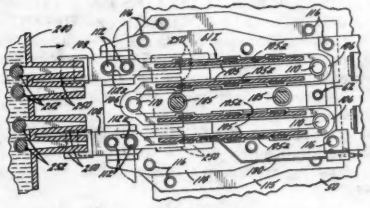
said plurality of panel sections further including a third panel section having a lower marginal edge coupled to an upper marginal edge of said first panel section, means for releasably coupling the lower marginal edge of said third panel section with the upper marginal edge of said first panel section, said coupling means including means for maintaining the lower marginal edge of a rectangular panel of said third section spaced from the upper marginal edge of an adjacent rectangular panel of said lower first section by said predetermined distance, said plurality of sections cooperating to form a grid-like wall member defined by a plurality of spaced apart individual rectangular panels.

4,573,514

ELECTRICALLY HEATABLE MOLD AND METHOD OF CASTING METAL STRAPS

Alby H. Wolf, Minneapolis, and Thomas L. Oswald, Roseville, both of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed May 21, 1982, Ser. No. 380,826
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] B22D *27/04, 5/02, 19/00*
U.S. Cl. 164—4.1 **20 Claims**



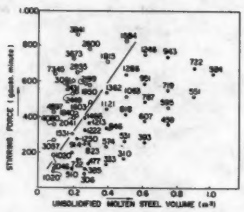
1. A method of casting metal straps on rows of lugs of battery cell elements, comprising:

providing a mold body made of electroconductive material and formed with a plurality of of parallel electrically interconnected sections each formed with an elongated strap cavity, conducting electrical current in series through the material of said mold cavity sections for heating said sections to a predetermined temperature in excess of the melting temperature of the metal to be cast, introducing metal in an amount adequate for forming a strap into each said cavity, immersing a row of element lugs into each said cavity, cooling said mold body to a temperature below the solidification temperature of said metal, and removing said element lugs from said cavities with straps cast thereon.

4,573,515
METHOD FOR ELECTROMAGNETICALLY STIRRING MOLTEN STEEL IN CONTINUOUS CASTING

Minoru Kitamura, Nishinomiya; Kenta Yoshii, Kakogawa; Shozo Kawasaki, Kobe; Katsuyoshi Matsuo, Kakogawa, and Mitsuo Tomonaga, Himeji, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 15, 1983, Ser. No. 475,692
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—468 **2 Claims**



1. A method for electromagnetically stirring molten steel in continuous casting wherein in producing cast slab and bloom, an electromagnetic stirring force is applied to the unsolidified molten steel in the cast slab and bloom being drawn, said method comprising stirring the unsolidified molten steel in the casting direction with an electromagnetic stirrer, which is located between drawing positions where the unsolidified thickness is 45% and 15%, respectively, of the thickness as viewed in the direction of the thickness of the cast slab and bloom, in such a manner that the product of the magnetic flux density, B, in gauss units, at the interface between the unsolidified and solidified portions, and the stirring time, T, which is defined as the ratio of the stirring effective length (mm) of the electromagnetic stirrer to the casting speed (m/min.), in minute units, is 1,600 gauss-min. or more per m^3 of the total volume, of unsolidified molten steel present in a region extending to the drawing side from the position where the electromagnetic stirrer is located.

4,573,516
METHOD OF AND APPARATUS FOR CASTING DIRECTIONALLY SOLIDIFIED ARTICLES

Peter N. Quested, Hampton, and James E. Northwood, Hampshire, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 214,660, Dec. 9, 1980, abandoned. This application Nov. 2, 1983, Ser. No. 548,023
Claims priority, application United Kingdom, Dec. 14, 1979, 7943193
Int. Cl.[4] B22D *23/06, 27/04*
U.S. Cl. 164—61 **32 Claims**

1. A method of controlling the formation of a crystalline structure comprising the steps of:

(a) progressively melting a crystalline material by effecting relative axial movement of the crystalline material with respect to a heat source; and

(b) subsequently extracting heat from the molten material to directionally solidify the molten material in step with the melting of step (a) to form an aligned crystalline microstructure wherein the extraction of heat from the molten material is accomplished by means of a fluidized bed of a fine chemically inert powder fluidized by an inert gas.

19. Apparatus for metal casting comprising:

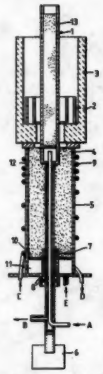
an open-ended mould,

a hollow metal platform through which water can be circulated for carrying said mould,

a heating chamber to heat the mould,

a fluidizable bed for cooling the mould, and

means for first moving the platform, and thus said mould, axially through said heating chamber and then on through

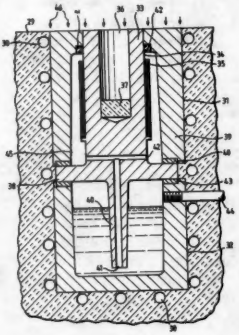


said fluidizable bed to thereby progressively heat a portion of said mould in said heating chamber prior to cooling of the mould portion in said fluidizable bed.

4,573,517
FIBER-REINFORCED METALS

Stuart E. Booth, Wantage; Andrew W. Clifford, Weymouth, and Noel J. Parratt, Loughton, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 11, 1983, Ser. No. 541,319
Int. Cl.[4] B22D *17/00, 19/00*
U.S. Cl. 164—61 **4 Claims**



1. A process for forming a composite material comprising a metal matrix incorporating a non-metallic fibrous reinforcement material including the steps of providing in a mould chamber at least one layer of the fibrous reinforcement material; connecting the mould chamber via a liquid metal conduit to an air-tight furnace substantially at the base of the mould chamber; evacuating the furnace to thereby evacuate the mould chamber via the metal conduit; heating the mould chamber and fibrous material to a temperature above the solidus temperature of the metal; connecting the furnace to a source of gas at a relatively low pressure to thereby force molten metal immersing the end of the conduit in the furnace to substantially fill the mould chamber under the combined action of the partial pressure in the mould chamber and the

relatively low pressure of the gas applied to the molten metal; and finally pressurizing the gas to thereby pressurize the molten metal in the mould chamber so as to force molten metal to surround substantially all of the fibers of the layer.

4,573,518

CASTING METHOD AND APPARATUS

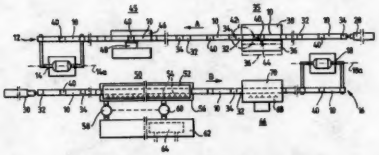
Richard Ward, Worsley, and Kenneth Cooper, Wigan, both of England, assignors to Dobson Park Industries Plc., Nottingham, England

Filed May 8, 1984, Ser. No. 608,278

Claims priority, application United Kingdom, May 19, 1983, 8313862

Int. Cl.[4] B22D *29/00, 33/04*

U.S. Cl. 164—69.1 **14 Claims**



1. A method of making T-shaped products comprising providing a central mould part having a top, a bottom, ends and sides, and a mould cavity therein extending from one side to the other, the mould cavity being of a generally cross configuration having a central part and two arms extending therefrom, with the central part of the cavity being of substantially greater volume than either of the arms of the cavity, sandwiching the sides of the central mould part between two mating outer mould parts to form a cavity closed except for a filling opening at the top of the central mould part leading to the arm of the cavity nearest the top of the part, casting molten metal into the cavity through the filling opening with the molten metal first filling the lower arm of the mould cavity, cooling the metal to at least partial solidification, removing the central mould part from between the outer mould parts and removing the casting from the central mould part out of a side thereof, shearing the casting in half to produce two similar T-shaped products, and quenching and drying the central mould part prior to reuse in the production of a further casting.

4,573,519

METHOD FOR FORMING METAL BASE COMPOSITE

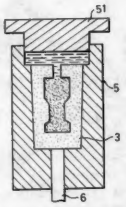
Tadashi Donomoto; Atsuo Tanaka, and Shinji Katou, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 8, 1984, Ser. No. 618,680

Claims priority, application Japan, Jun. 27, 1983, 58-115597

Int. Cl.[4] B22D *19/14*

U.S. Cl. 164—97 **7 Claims**



1. A method for forming a metal-base composite, comprising the following steps:

a first step in which a mass of fibrous reinforcing material is taken into a retaining tool having a concavity for receiving the said fibrous reinforcing material and at least one opening, said retaining tool being composed of a water-soluble salt having a high melting point, and said concavity having the same shape as the metal-base composite to be formed;

a second step in which the said retaining tool containing the said fibrous reinforcing material is heated above a certain temperature and then set into a die having a means for receiving the said retaining tool;

a third step in which, through the said opening, a molten matrix metal is made to contact and infiltrate the said fibrous reinforcing material in the said die, and allowing solidification of the said matrix metal to form a composite incorporating the fibrous reinforcing material;

a fourth step in which the said retaining tool containing the said composite is removed from the said die; and

a fifth step in which said retaining tool is dissolved away with water.

4,573,520

APPARATUS FOR RAPID TEMPERING A METAL OR ALLOY ON A MOVING BELT

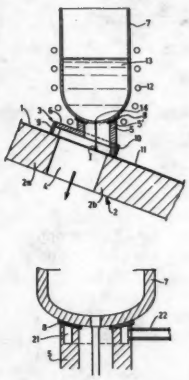
Pascal Fournier, Nancy, and Jean-Claude Peraud, Perigny sur Yerres, both of France, assignors to Pont A Mousson S.A., Nancy, France

Filed Jan. 14, 1983, Ser. No. 458,080

Claims priority, application France, Jan. 21, 1982, 82 00896

Int. Cl.[4] B22D *11/06, 27/15*

U.S. Cl. 164—253 **3 Claims**



1. An apparatus for rapidly quenching a metal or an alloy in a molten state, comprising:

(a) a cooled belt (1) driven at a high speed,

(b) a vacuum chamber (3) disposed around a portion of the belt, said vacuum chamber comtains a casting chamber (32), and upstream thereof, a lock-chamber (31) for maintainingthe transition between the atmosphere pressure and the reduced pressure in which casting is carried out,

(c) an opening in an upper cover (6) of the chamber terminating in a seating rim (5'), wherein said opening is provided at the end of a tubular support (5) projecting from the upper cover of the chamber,

(d) a crucible (7) disposed outside of the chamber and having a bottom portion resting on the seating rim and wherein said seating rim has a configuration complementary to that of the bottom of the crucible, and

(e) a casting orifice (14) in said bottom portion of the crucible, whereby a jet of liquid metal or alloy projected through the orifice and onto the moving belt is formed into a rapidly quenched ribbon,

(f) a gas-permeable sealing washer (8) interposed between said rim and said bottom portion of said crucible,

(g) means for sweeping the area between the crucible bottom and the seating rim with an antioxidation purge gas, said sweeping means comprises an annular groove (21) in the rim connected to a source of purge gas.

4,573,521

TESTING APPARATUS FOR DETECTING DAMAGE OF THE CASTING BELTS OF A CONTINUOUS CASTING MOLD

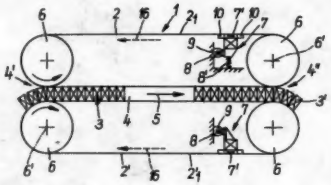
Gerd Artz, Ratingen, and Dieter Figge, Essen, both of Fed. Rep. of Germany, assignors to Haftung Fried. Krupp Gesellschaft mit beschränkter, Essen, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,402

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342941

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—451 **18 Claims**



1. In a continuous metal caster of the type having mold walls formed by a pair of vertically opposed co-rotating endless casting belts and a pair of co-rotating lateral dam blocks; the improvement comprising testing means disposed adjacent said casting belts during operation of said caster for detecting damage to said casting belts, said testing means including a respective plurality of ultrasonic testing units disposed adjacent a surface of each said casting belt, with each said testing unit having an ultrasonic transmitter-receiver sonically coupled to the adjacent said casting belt; and means for mounting each said testing unit so that it is stationary with respect to the direction of movement of the adjacent said casting belt.

16. A method of continuously monitoring the casting belts of a continuous metal caster, which is of the type having co-rotating mold walls formed by a pair of vertically opposed endless casting belts and a pair of lateral dam blocks, for the detection of damage to the casting belts during operation of the caster comprising:

positioning a respective plurality of ultrasonic transmitter-receiver testing units adjacent each of the casting belts so that they are stationary with respect to the direction of movement of the adjacent casting belt, and sonically coupled to the surface of the associated casting belt;

transmitting ultrasonic energy from each of the testing units into the adjacent casting belt;

receiving reflected ultrasonic energy from the adjacent casting belt at each of said testing units; and

detecting damage to a casting belt from any difference between the received signals at a testing unit resulting from reflection from a fault in the casting belt.

4,573,522

PROCESS AND APPARATUS FOR AUTOMATING A BAKING CYCLE UNDER HOT AIR OF SAND MOLDS

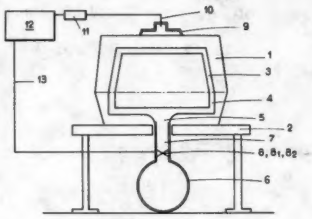
Pierre L. Merrien, Billere, and Pierre A. Merrien, Sceaux, both of France, assignors to Etude et Development en Metallurgie, Billere, France

Continuation of Ser. No. 210,623, Nov. 26, 1980, abandoned. This application Jul. 18, 1984, Ser. No. 631,521

Claims priority, application France, Nov. 28, 1979, 79 29227

Int. Cl.⁴ B22D *46/00*

U.S. Cl. 164—456 **17 Claims**



1. An automation process for a hot air baking cycle of a sand mold, said process comprising the steps of:

(a) determining at least one optimal baking parameter associated with drying said mold by hot air baking of said sand mold during a calibration stage by:

(i) recording at least one parameter associated with drying said sand mold;

(ii) casting a sample in said mold;

(iii) examining the surface of said sample for microporosities by means of fluorescent sweating; and

(iv) establishing correlations between the at least one recorded parameter and said microporosities on the surface of said sample to obtain at least one optimal drying parameter; and

(b) regulating a hot air inlet for baking said sand mold before casting an element in a sand mold during a casting stage in a manner so as to assure correspondence between the at least one optimal parameter determined in step (a) and those actually obtained during step (b).

4,573,523

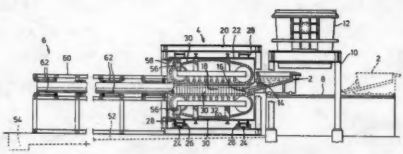
METHOD OF AND APPARATUS FOR CONTINUOUS CENTRIFUGAL CASTING

Felim McCaffrey, Toronto, Canada, assignor to Hatch Associates Ltd., Totonto, Canada

Filed Nov. 5, 1984, Ser. No. 668,990

Int. Cl.⁴ B22D *11/06, 11/126, 13/02*

U.S. Cl. 164—460 **11 Claims**



1. Apparatus for the continuous casting of metal comprising a tubular mould having an inner wall formed by cooperation of pallets in adjacent runs of a plurality of endless belts each formed of plural pallets and disposed around and extending longitudinally of the mould, a common frame supporting said belts, means to drive said belts so that the inner wall formed by said pallets of said belts moves continuously through the tubular mould formed thereby from one end to the other, means for rotating said common frame and said belts about a longitudinal

axis of said mould, means to supply molten metal to said inner wall at said one end of the tubular mould, means to cool said mould whereby to solidify said molten metal on said inner wall, and means to withdraw a tube formed by said solidified metal from the other end of said tubular mould.

9. A method for the continuous casting of metal, comprising pouring molten metal onto the inner wall of a tubular mould at one end thereof, the mould being formed by pallets of cooperating inward facing runs of a plurality of continuously moving conveyor belts, so that the inner wall of said tubular mould advances continuously from said one end to the other end of the mould, conjointly rotating said plurality of belts about the longitudinal axis of said tubular mould so as centrifugally to distribute said molten metal over said inner wall to form a tubular layer, cooling said mould pallets to solidify the metal, and withdrawing the cast tube so formed from the other end of said mould.

4,573,524

HEAT EXCHANGER

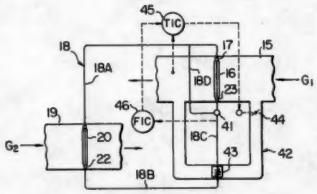
Ikuo Kotaka, Hiroshima, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 622,725, Jun. 20, 1984. This application Apr. 30, 1985, Ser. No. 728,867

Claims priority, application Japan, Jun. 21, 1983, 58/110233; Jun. 21, 1983, 58/110235; Jun. 22, 1983, 58/94949[U]

Int. Cl.[4] F28D *15/00*; F28F *27/00*

U.S. Cl. 165—96 **2 Claims**



1. A heat exchanger incorporating a heat pipe apparatus, said heat pipe apparatus comprising:

evaporative pipe group disposed within a flow of a heating fluid;

first condenser pipe group located away from and lower from said evaporative pipe group and disposed within a flow of a fluid to be heated; and

first passage means for connecting said evaporative pipe group with said condenser pipe group and through which a working medium passes between said both pipe groups;

characterized in that said heat pipe apparatus further comprises bubble generator disposed within a bypass passage through which a portion of said heating fluid branched off from said heating fluid flows so as to generate bubbles, whereby said working medium is forcedly circulated throughout said first passage means.

4,573,525

THERMALLY ACTUATED HEAT EXCHANGE METHOD AND SYSTEM

Hermon Boyd, Rte. 3, Box 73JJ, Red Oak, Tex. 75154

Filed Mar. 28, 1985, Ser. No. 716,992

Int. Cl.[4] F28D *15/00*

U.S. Cl. 165—104.22 **6 Claims**

1. A heat actuated self pumping heat exchange system comprising:

a heat absorbing means for receiving radiant heat energy of a generally uniform distribution;

said heat absorbing means operatively divided into a primary heating zone, a boiler zone, and an accumulator heating zone, all in thermal communication;

riser tube operatively affixed to said primary heating zone for thermal communication;

flash boiling means operatively affixed to said boiler zone for thermal communication;

accumulator operatively affixed to said accumulator heating zone for thermal communication;

said riser tube operatively affixed to said flash boiling means for fluid communication;

vapor piston tube in fluid communication with said flash boiler and a condensing means;

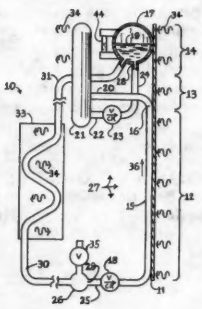
said condensing means in thermal communication with heat rejecting means;

said vapor piston tube of a diameter smaller than the maximum possible vapor bubble diameter;

said condensing means in fluid communication with an upper means for preventing reverse flow of coolant in said condensing means and for providing a pressure separation;

said upper means for preventing reverse flow in fluid communication with said accumulator;

conduit means for conveying heated said coolant from said accumulator to a coolant cooling zone;



said cooling zone removing heat absorbed by said coolant in said riser tube and in said flash boiling means and in said accumulator;

a second conduit means in fluid communication with said cooling zone and with a lower coolant distribution means for conveying said coolant;

a servicing means for evacuating the said system and charging with said coolant;

said coolant with condensible fluid properties;

a lower means for preventing said coolant reverse flow of said coolant in said riser tube in said lower coolant distribution means;

said riser tube is in fluid communication with said lower means for preventing said coolant reverse flow;

said heat absorbing means with optical coating means for enhancing absorptivity of said radiant heat;

a singular vapor pulse pumping means comprises of said liquid discharge conduit means, said lower means for preventing reverse flow, said riser tube, said flash boiling means, said vapor piston tube, said condensing means, and said upper means for preventing reverse flow.

4,573,526

STEAM GENERATOR FLOW CONTROL DEVICE

Ingvar K. E. Jung, Nacka, Sweden, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 15, 1983, Ser. No. 475,587

Claims priority, application Sweden, Apr. 28, 1982, 8202676

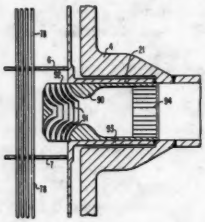
Int. Cl.[4] F28F *9/22*

U.S. Cl. 165—134.1 **11 Claims**

1. A flow distributor for a shell and tube heat exchanger having a shell side inlet nozzle so disposed in said shell that a

central axis of said inlet nozzle is generally perpendicularly oriented with respect to said tubes;

said flow distributor being disposed within said shell on the shell side end of said inlet nozzle and having a plurality of vanes which generally direct the flow of fluid from said inlet nozzle into said shell in a generally radial direction with respect to said central axis of said inlet nozzle and



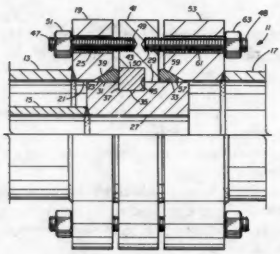
said vanes being symmetrically disposed about perpendicular planes passing through said central axis, a first plane generally parallel to the tubes and a second plane generally perpendicular to the tubes, said vanes being formed to distribute a substantially greater portion of the inlet flow from said inlet nozzle in a general direction away from said first plane than from said second plane.

4,573,527

HEAT EXCHANGER CLOSURE CONNECTION

M. J. McDonough, P.O. Box 40082, Houston, Tex. 77240

Filed Jul. 29, 1983, Ser. No. 518,547
Int. Cl.[4] F28F 9/26
U.S. Cl. 165—154 **16 Claims**



1. A heat exchanger closure connection, which comprises:

a tubular shell including an outwardly extending shell closure flange having a shell closure flange sealing surface;

an inner tube positioned within said shell and including an outwardly extending tube closure flange, said tube closure flange including a first sealing surface and an axially spaced apart second sealing surface;

a locking flange positioned about said tube closure flange between said first and second sealing surfaces of said tube closure flange;

a first seal ring positioned between said first seal surface of said tube closure flange and said shell closure flange sealing surface;

means for interconnecting said locking flange with said tube closure flange and transmitting axial forces on said locking flange toward said shell closure flange;

first means for urging said locking flange toward said shell closure flange, thereby to interconnect said tube closure flange and said shell closure flange and to urge said shell closure flange sealing surface and first sealing surface of said tube closure flange into sealing engagement with said first seal ring;

a tube end extension tube extending axially from said inner tube and including an outwardly extending tube end closure flange having a tube end closure flange sealing surface positioned adjacent said second sealing surface of said tube closure flange;

a second seal ring positioned between said tube end closure flange sealing surface and said tube closure flange sealing surface;

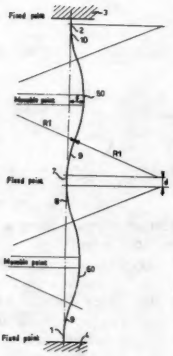
and a second means for urging said tube end closure flange toward said locking flange, thereby to interconnect said tube closure flange and tube end closure flange and to urge said second seal surface of said tube closure flange and said tube end closure sealing surface into sealing engagement with said second seal ring.

4,573,528

HEAT EXCHANGERS WITH CLUSTERS OF STRAIGHT OR CORRUGATED TUBES, ESPECIALLY TO SYSTEMS FOR SUPPORTING THE TUBES AT FIXED AND MOVABLE AXIAL LEVELS

Georges Trepaud, 1, Rond Point Bugeaud, 75016 Paris, France

Filed Dec. 29, 1981, Ser. No. 335,537
Claims priority, application France, Jan. 8, 1981, 81 00212; Feb. 16, 1981, 81 02993
Int. Cl.[4] F28D 7/08; F28F 9/00, 9/22
U.S. Cl. 165—162 **8 Claims**



1. An improved heat exchanger, expecially for a steam generator, capable of accomodating differential thermal expansion of its components, having

a plurality of linear heat exchange tubes (5) arranged in an array of concentric circular rows with their axes vertical and parallel;

a cylindrical casing (11) surrounding said linear heat exchange tubes;

a plurality of concentric supporting systems, each maintaining the arrangement of a circular row of the heat exchange tubes by permitting lateral deflecting movement of the tubes at certain movable axial levels while securely maintaining the tubes in vertical alignment at a plurality of certain axial fixed levels,

a plurality of radial arms (14, 14' . . . 14*n*) secured in fixed axial relation to said cylindrical casing (11),

each of said tube supporting systems at the movable axial levels including

a zig-zag strip (21, 21' . . . 21*n*), bent in a circle and having alternately facing trapezoidal cells,

a surrounding circular support strip (20, 20' . . . 20*n*) welded to engaging portions of said zig-zag strip, and

a closing strip (22, 22' . . . 22*n*) having one face positioned at

and contacting the side of a zig-zag strip remote from the supporting strip and its other face movably contacting the support strip of the concentrically adjacent tube supporting system, said supporting systems being supported at one of said axial levels, after installation of the tubes, by at least one of said radial arms;

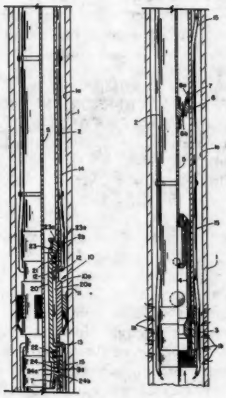
wherein at least some of the tube supporting systems at said movable axial levels (**20, 21, 22; 20', 21', 22'; . . . 20*n*, 21*n*, 22*n***) are independent of the tube supporting system concentrically adjacent, in radial direction, in order to permit certain of said circular rows of the heat exchange tubes (**5**) to undergo thermal expansion differing from the thermal expansion of the tubes of others of said circular rows without exerting damaging mechanical stresses on the tube supporting systems, and to form groups of tube supporting systems.

4,573,529

HIGH FLOW INJECTION ANCHOR

Paul A. Reinhardt, Houston, Tex., assignor to Aker Oil Tools, Inc., Orange, Calif.

Filed Mar. 12, 1984, Ser. No. 588,451
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—68 **12 Claims**



1. Apparatus for anchoring a tubing string in a subterranean well casing and concurrently providing an axially extending fluid passage through the anchor which is isolated from both the tubing bore and the casing annulus comprising, in combination, an anchor having a tubular body sealingly connectable in the tubing string; slip means on the exterior of said tubular body engagable with the casing bore, a pair of axially spaced radially extending port means in said tubular body or body extensions, the upper one of said radial port means being connectable to first conduit means extending to the surface, the lower one of said radial port means being connectable to second conduit means extending therebelow; a sucker rod string insertable through the tubing string to support a rod-type pump adjacent the production zone; a sleeve surrounding and attached to said string and carrying two external seals respectively positionable above said upper radially extending port and below said lower radially extending port; said sleeve having an axially extending recess on its outer surface intermediate said two external seals, thereby providing a fluid connection between said radial ports; and releasable latch means on said sleeve for releasably positioning said sleeve in sealing, straddling relationship to said radial ports.

4,573,530

IN-SITU GASIFICATION OF TAR SANDS UTILIZING A COMBUSTIBLE GAS

Costandi A. Audeh, Princeton, N.J., and Robert D. Offenhauer, Bradenton, Fla., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,140
Int. Cl.[4] E21B *43/243;* C10J *5/00*
U.S. Cl. 166—260 **12 Claims**

1. A method for the in-situ recovery of a combustible product gas consisting essentially of carbon monoxide and hydrogen from a subterranean, viscous oil-containing formation including tar sand deposits traversed by at least one injection well and one production well and wherein said oil-containing formation has previously been subjected to an in-situ combustion operation for a period of time sufficient to recover the maximum amount of oil therefrom and leaving a solid, coke like residue on the formation mineral matrix, comprising the steps of:

(a) introducing a combustible gas selected from the group consisting of methane, ethane, propane, natural gas or mixtures thereof into the formation via said injection well in an amount to substantially saturate the formation with said gas;

(b) introducing an oxygen-containing gas into the formation via said injection well to reinitiate in-situ combustion therein;

(c) thereafter introducing a mixture of an oxygen-containing gas and steam into the formation via said injection well causing conversion of the coke-like material to a combustible product gas consisting essentially of carbon monoxide and hydrogen in the formation; and

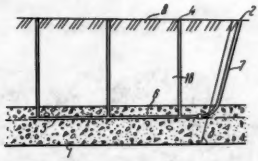
(d) recovering the combustible product gas from the subterranean formation via said production well.

4,573,531

METHOD OF UNDERGROUND GASIFICATION OF COAL SEAM

Ivan S. Garkusha; Vadim N. Kazak, and Valery K. Kapralov, all of Moscow, U.S.S.R., assignors to Vsesojuznoe Nauchno-Proizvod-Stvennoe Obiedinenie "Sojuzpromgaz", U.S.S.R.

Filed Feb. 9, 1984, Ser. No. 578,527
Claims priority, application U.S.S.R., Feb. 21, 1980, 2887369
Int. Cl.[4] E21B *33/138, 43/247*
U.S. Cl. 166—259 **4 Claims**



1. A method of underground gasification of a coal seam, comprising the steps of:

determining the depth of occurrence and the thickness of a coal seam;

opening said coal seam by drilling operating injection and production wells therein;

interconnecting said wells within said coal seam;

forming gasification passages within said coal seam; and

igniting said coal and gasifying the same by supplying a gaseous medium through said injection wells and removing the produced gas from said production wells,

said coal seam being gasified successively layer by layer from the roof of said coal seam to the bottom thereof,

the drilling of said operating wells, their interconnection, the igniting of the coal and formation of said gasification passages being effected successively within each layer

from top to bottom with gasification of each under-layer being started after the overlying layer is gasified and no shifting occurs in the rock overlying the gasified layer, shifting thereof resulting from the gasification of the layer supporting the rock,

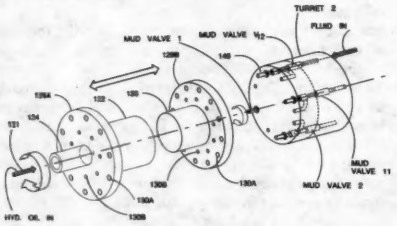
the thickness of each gasified layer being chosen so that the height of a zone containing cracks formed as a result of the shift of the overlying rock does not exceed the depth of said gasified layer.

4,573,532

JACQUARD FLUID CONTROLLER FOR A FLUID SAMPLER AND TESTER

William R. Blake, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 14, 1984, Ser. No. 650,959
Int. Cl.[4] E21B *49/08, 47/06*
U.S. Cl. 166—264 **30 Claims**



1. A system for controlling fluid flow in a device, comprising:

at least one control member having a plurality of holes therein, the holes being arranged in a plurality of patterns associated with desired functions of the device, the at least one control member cooperable with means for permitting fluid flow within the device to carry out the desired functions; and

means to selectively adjust the relative position of the at least one control member to the means for permitting fluid flow to carry out the desired functions.

4,573,533

METHOD FOR USING THERMALLY STABLE MOBILITY CONTROL AGENTS FOR HARSH ENVIRONMENTAL RESERVOIRS

Roderick G. Ryles, Stamford, and Albert G. Robustelli, Darien, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 21, 1984, Ser. No. 622,899
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—275 **11 Claims**

1. In a method for recovering petroleum from a sub-terranean petroleum-bearing deposit which comprises injecting an aqueous polymer solution into the area of said deposit through at least one input well to cause said petroleum to flow from said area for collection through at least one output well, the improvement which comprises maintaining and controlling the viscosity of said solution by utilizing, in the substantial absence of oxygen, a water-soluble copolymer containing from about 30–70 mole percent of 2-acrylamido-2-methylpropanesulfonic acid or a salt thereof and from about 70–30 mole percent of an acrylic monomer, the temperature at the petroleum-bearing deposit being at least 60° C.

4,573,534

CEMENT COMPOSITIONS AND METHOD OF CEMENTING CASING IN A WELL

Wilford S. Baker, Thibodaux, La., and James J. Harrison, Glenshaw, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 466,550, Feb. 15, 1983, Pat. No. 4,462,836, and a continuation-in-part of Ser. No. 466,551, Feb. 15, 1983, Pat. No. 4,462,837, and a continuation-in-part of Ser. No. 518,091, Jul. 28, 1983, abandoned. This application Jun. 12, 1984, Ser. No. 650,071
Int. Cl.[4] C04B *24/04, 24/38;* E21B *33/14*
U.S. Cl. 166—293 **75 Claims**

1. A cement composition for the preparation of a novel aqueous slurry useful in cementing casing in the borehole of a well comprising (1) a cement selected from Class A through H, (2) at least one polysaccharide, and (3) a 1,2-dicarbonyl wherein the amount of said 1,2-dicarbonyl is sufficient to obtain a viscosity of an aqueous slurry prepared from the composition at 140° F. and atmospheric pressure which is greater than the viscosity of such slurry at 70° F. and atmospheric pressure.

44. A method of cementing casing in the borehole of a well comprising suspending the casing in the borehole of a well, whether vertical or slanted, pumping an aqueous cement slurry comprising (1) a cement selected from Class A through Class H, (2) at least one polysaccharide, (3) water, and (4) a 1,2-dicarbonyl wherein the amount of said 1,2-dicarbonyl is sufficient to obtain a viscosity of such aqueous slurry at 140° F. and atmospheric pressure which is greater than the viscosity of said slurry at 70° F. and atmospheric pressure into the well until said slurry fills that portion of the space desired to be sealed and then maintaining said slurry in place until the cement sets.

4,573,535

SLEEVE-TYPE LOW PRESSURE RESPONSIVE APR TESTER VALVE

Kevin R. Manke, Marlow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 2, 1984, Ser. No. 667,651
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—321 **18 Claims**

1. A valve for use in a well testing string located in a wellbore and having a packer arranged for selectively sealing the wellbore isolating that portion of the wellbore above the packer from that portion of the wellbore below the packer to allow the production of fluids from that portion of the wellbore below the packer through said valve in the testing string as well as the introduction of fluids into that portion of the wellbore below the packer through said valve in the testing string, said valve being responsive to changes in the pressure of the fluid in the annulus between the wellbore and the well testing string in that portion of the wellbore above the packer when the packer sealingly engages the wellbore, said valve comprising:

a housing;

mandrel means, slidably disposed within said housing, for providing a fluid conduit within said housing;

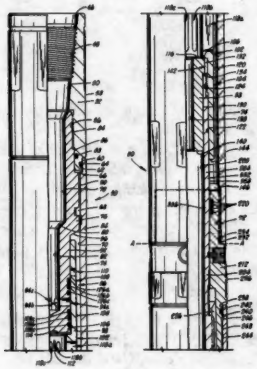
means, responsive to changes in the pressure of the fluid in the annulus, for moving said mandrel means to a valve open position when the pressure of the fluid in the annulus changes from a hydrostatic pressure to a greater than hydrostatic pressure and for moving said mandrel means to a valve closed position when the pressure of the fluid in the annulus changes from the greater than hydrostatic pressure to a lesser pressure; and

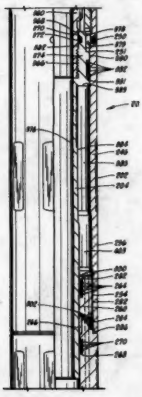
sleeve valve means, connected to said housing, for providing a controllable fluid passageway in communication with said fluid conduit provided by said mandrel means, said sleeve valve means including:

an outer cylindrical sleeve member having a central web portion from which extend a ported end portion, having a first radial opening defined therethrough intermediate said web portion and a terminating edge of said ported end portion, and an interface end portion, having an

internally threaded surface disposed intermediate said web portion and a terminating edge of said interface end portion, said internally threaded surface engaging with a complemental threaded surface of said mandrel means so that at least a portion of said interface end portion is concentrically disposed about a portion of said mandrel means, and said web portion having a cavity defined therein in fluid communication with said fluid conduit provided by said mandrel means;

ported plug means for providing a fluid channel communicating with the outside of said housing, said ported plug means including a body having a closed end disposed





adjacent said web portion concentrically within said ported end portion of said outer cylindrical sleeve member when said mandrel means is at said valve closed position, said body also having a second radial port defined therein for communicating with said first radial opening of said sleeve member when said mandrel means is at said valve open position;

first seal means for providing a seal between said first and second radial openings when said mandrel means is at said valve closed position; and

second seal means for providing a seal between said closed end of said ported plug means body and said ported end portion of said sleeve member.

4,573,536

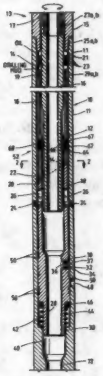
METHOD AND APPARATUS FOR FLUSHING A WELL

James D. Lawrence, Conroe, Tex., assignor to Dailey Petroleum Services Corporation, Conroe, Tex.

Filed Nov. 7, 1984, Ser. No. 654,770

Int. Cl.[4] E21B *34/14, 21/10*

U.S. Cl. 166—373 **12 Claims**



1. A flushing apparatus for a drill string with an elongate central bore, said apparatus comprising:

a remotely operable tubular mechanism, said mechanism having a central bore and being arranged to maintain fluid communication through said drill string bore, said mechanism including a hollow barrel, a hollow stem concentrically contained within said barrel, a hollow stem concentrically contained within said sleeve and connectable on its upper end to a source of rotary motion, and a rachet device adapted to transfer rotary motion in one direction between said sleeve and said stem and to free-wheel in response to rotary motion in the opposite direction; and

a tubular flush valve operatively connected to said mechanism, said valve including a central bore and being arranged to maintain fluid communication through said drill string bore.

9. A method of flushing a well comprising the steps of:

jarring the string;

converting the jarring motion into a motion suitable for operating a flush valve, wherein said converting involves converting rotary jarring motion in either of two directions into rotary motion in only one direction; and

connecting said flush valve operating motion to a flush valve to cause automatic flushing of the well in concert with said jarring.

4,573,537

CASING PACKER

Alan R. Hirasuna, Newport Beach, and Gordon R. Veal, Mission Viejo, both of Calif., assignors to L'Garde, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 261,468, May 7, 1981, abandoned. This application Aug. 24, 1984, Ser. No. 644,495

Int. Cl.[4] E21B *33/128*

U.S. Cl. 166—387 **59 Claims**

1. A casing packer for sealing the annulus between a well casing and a tube extending therein by direct application of radial force to a seal element, said casing packer comprising:

a tubular mandrel;

means, mounted on said mandrel, for engaging said casing to lock said mandrel in place at said location; and

means, mounted on said mandrel, for sealing the annulus between said mandrel and said casing, comprising:

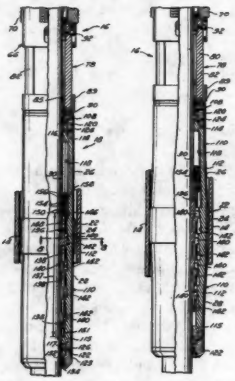
a seal element formed of permanently deformable, non-elastomeric material;

first and second wedges;

means for driving said first wedge axially to drive said second wedge radially outward and thereby drive said seal element radially outward beyond the elastic limit of said seal element, to permanently deform said seal element against said casing by direct application of radial force to said seal element; and

means for withdrawing said first wedge radially inward to permit said seal element to deform inwardly in response to interference between said seal element and said well casing during removal of said casing packer from said well casing.

26. A method for recovering oil, using high temperature fluids in excess of 575° F., in which the annulus between a well casing and a tube extending therein is sealed to prevent passage of said high temperature fluids through said annulus, said tube having a concentric, non-elastomeric seal element mounted thereon, said method comprising:



driving said non-elastomeric seal element radially outward against said well casing by direct application of radial force thereto, to provide an interface with said casing which seals said annulus to prevent the passage of said high temperature fluid therethrough, said radial force sufficient to permanently deform said seal element;

conducting said high temperature fluid in excess of 575° F. through said tube, said fluid heating the geologic formation surrounding the well to free oil in said formation, said non-elastomeric material capable of withstanding said temperature in excess of 575° F.;

creating a void behind said seal element throughout the entire length of said interface to permit radially inward deflection of said permanently deformed seal element throughout the entire length of said interface; and

removing said seal element from said well casing by applying a pulling force to said metal seal element at a location above said interface.

4,573,538

HORSE HOOF-SHOEING SOLE PLATE

Michel Figueras, Les Fuziers, 38540 Saint Just Chaleyssin, France

Filed Nov. 9, 1984, Ser. No. 669,953

Claims priority, application France, Nov. 14, 1983, 83 18250

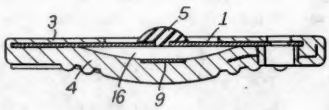
Int. Cl.⁴ A01L *5/00, 7/02*

U.S. Cl. 168—14 **11 Claims**

1. A sole plate for attachment to the hoof of a horse by means of plural screws, which plate comprises:

(a) a reinforcement frame in the configuration of a plate;

(b) a casing integrally formed of a material having a Shore hardness in the range of 45 to 100, the casing enclosing the frame and being defined by a top layer extending at least partially across and being adhered to the top surface of the frame, and a bottom layer including an outer wear surface and an inner surface, the inner surface being partially adhered to the bottom surface of the frame, with the unadhered portions of the inner and bottom surfaces collectively defining a central zone, the bottom layer being provided with a plurality of openings through which the bottom surface of the frame may be observed and screws may be engaged;



(c) a hole formed in the frame for permitting access to the central zone; and

(d) a valve closing the hole and formed of a resilient and self-sealing material having a Shore hardness in the range of 25 to 55, the valve being configured to permit the insertion of a needle therethrough for injecting compressed fluid into the central zone and inflating the portion of the bottom layer corresponding to the adhered portion of its inner surface.

4,573,539

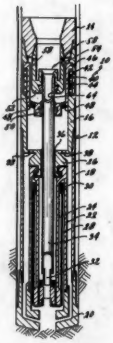
HYDRAULICALLY PULSED INDEXING SYSTEM FOR SLEEVE-TYPE CORE BARRELS

Jimmy L. Carroll, Bountiful, and James T. Aumann, Salt Lake City, both of Utah, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Oct. 7, 1983, Ser. No. 539,924

Int. Cl.⁴ E21B *25/06*

U.S. Cl. 175—58 **16 Claims**



1. An apparatus for use in a coring tool in a drill string in which hydraulic pressure is selectively applied, said drill string including a core barrel, and a flexible sleeve for receiving a core into said core barrel, said sleeve radially contracting upon application of longitudinal tension thereto, said apparatus comprising:

a stripper tube coupled to said flexible sleeve and concentrically disposed within said core barrel;

piston means slidingly disposed within said coring tool between a first upper and second lower longitudinal position, said stripper tube being disposed through said piston means and generally longitudinally displaceable with respect thereto, said piston means selectively seizing said

stripper tube when said piston means is urged longitudinally upward; and

resilient means for selectively applying and continuously maintaining an upward tensile force to said stripper tube independent of hydraulic pressure in said coring tool and thence applying said tensile force to said flexible sleeve and core disposed therein,

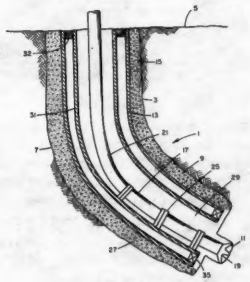
whereby a core may be cut from a highly fractured rock formation and retentively disposed within said flexible sleeve while said sleeve is continuously maintained under tension by combined operation of said stripper tube and piston means.

4,573,540

METHOD FOR DRILLING DEVIATED WELLBORES

Thomas B. Dellinger, Duncanville; Eugene A. Hoppe, Kingwood, and Charles E. Jones, Houston, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,757
Int. Cl.[4] E21B *7/04, 47/022*
U.S. Cl. 175—61 **10 Claims**



1. A method of drilling a deviated wellbore into the earth by a rotary drilling technique wherein a drill string is used to advance a drill bit through the earth and a drilling fluid is circulated down the drill string and returned from the wellbore in the annulus formed about the drill string, comprising the steps of:

(a) drilling a vertical first portion of said wellbore into the earth from a surface location to a kick-off point at about the lower end of said first portion by rotating and advancing a drill string and drill bit into the earth,

(b) initiating a deviated second portion of said wellbore at said kick-off point,

(c) withdrawing said drill string and drill bit from said wellbore,

(d) lowering a casing into said borehole and cementing said casing in place from the earth's surface to a point below said kick-off point,

(e) lowering a casing liner within said casing, said liner having an outside diameter less than the inside diameter of said casing and extending coextensively with said casing at least from above said kick-off point to the lower end of said casing below said kick-off point,

(f) spacing said liner from said casing,

(g) affixing said liner so that it is not free to rotate within said casing,

(h) running said drill string and drill bit through said liner until said drill string lies along the lower side of said liner below said kick-off point and said drill bit is located below the lower end of said liner, whereby said liner protects said casing from damage by the rotation of said drill string during the drilling of said second deviated portion of said wellbore,

(i) drilling said deviated second portion of said wellbore by rotation of said drill string as it lies along the lower side of said liner,

(j) pulling said drill string and drill bit from said wellbore after excessive wear has been imparted to said liner by the rotation of said drill string as it lies on the lower side, or is pulled into the upper side, of said liner,

(k) withdrawing said liner from said wellbore,

(l) lowering a replacement liner within said casing, said replacement liner also extending coextensively with said casing at least from above said kick-off point to the lower end of said casing below said kick-off point, and

(m) rerunning said drill string and drill bit into said wellbore and continuing the drilling of said deviated second portion of said wellbore, and

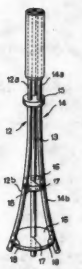
(n) repeating steps (k) through (m) for a plurality of drilling intervals and a plurality of replacement liners until the drilling of the deviated second portion of said wellbore has been completed.

4,573,541

MULTI-DRAIN DRILLING AND PETROLEUM PRODUCTION START-UP DEVICE

Jean-Jacques Josse, Toulouse; Guy Pujols, La Serre de Cazaux, and Serge Di Vincenzo, Cassagne, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Aug. 9, 1984, Ser. No. 638,992
Claims priority, application France, Aug. 31, 1983, 83 13981
Int. Cl.[4] E21B *7/08, 43/28, 29/06*
U.S. Cl. 175—78 **11 Claims**

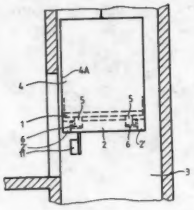


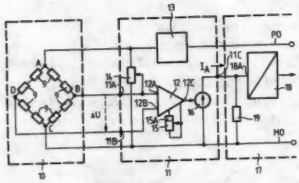
1. A drilling and petroleum production start-up device of a drilling well comprising a master well and at least one branched well opening into said master well, said device comprising an outer tube having an inner wall, and at least one take-off assembly fastened in situ in said outer tube and incorporating several take-off tubes, at least one of which has a lower end which communicates with a branched well, a space located between said take-off tubes and the inner wall of the outer tube being filled with cement, in order to produce a take-off assembly in the form of a compact and rigid block, said device incorporating a receptacle fastened to the take-off assembly and possessing bores in which upper ends of the take-off tubes are received, a movable connection assembly being interposed between the take-off assembly and surface means necessary for the working of the drilling well, wherein the connection assembly incorporates at least three hollow lengthening pieces having opposing ends, one of said lengthening pieces being capable of being received by one of its ends in one of the take-off tubes, its other end communicating with the surface of the drilling well, and means of blocking the other take-off tube or tubes.

4,573,542
LOAD-WEIGHING APPARATUS FOR AN ELEVATOR CAR

Urs Schlegel, Emmenbrücke; Ljudevit Tomse, Dierikon, and Urs Wenger, Lucerne, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Feb. 4, 1985, Ser. No. 698,131
Claims priority, application Switzerland, Feb. 14, 1984, 707/84
Int. Cl.[4] G01G *19/52, 3/14;* G01L *1/22*
U.S. Cl. 177—132 9 Claims





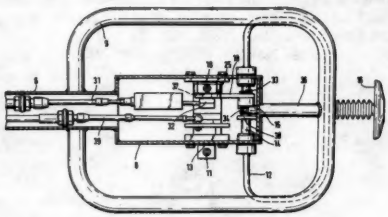
1. A load-weighing apparatus for an elevator car, comprising:
- a predetermined number of wire stain gauges;
- a predetermined number of load-subjected components provided at said elevator car and subjected to the a load to be weighed;
- said predetermined number of wire strain gauges being directly mounted at said elevator car at said load-subjected components;
- a bridge circuit having an output side and formed by said predetermined number of wire strain gauges;
- an amplifier circuit having an input side and an output side;
- said input side of said amplifier circuit being connected to said output side of said bridge circuit;
- said amplifier circuit including means for imparting a higher gain to the amplifier circuit in the presence of small loads than in the presence of high loads of the elevator car;
- said amplifier circuit including a voltage-controlled current source at said output side of said amplifier circuit; and
- an elevator control connected to said output side of said amplifier circuit.

4,573,543
DOUBLE-SAFETY ARRANGEMENT FOR A SELF-PROPELLED HAND-GUIDED MACHINE

Jean M. Bataille, Saint-Valery-en-Caux, France, assignor to Dynapac AB, Solna, Sweden

Filed Jan. 25, 1985, Ser. No. 694,934
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 8402033[U]
Int. Cl.[4] B60K *29/02*
U.S. Cl. 180—19.1 14 Claims

1. A double-safety arrangement for a self-propelled, hand-guided machine such as a duplex-vibratory roller equipped with a control column for facilitating control of the machine by an operator, the machine being further equipped with switching linkage means actuable for engaging the machine for forward and rearward travel and having a neutral position to which said linkage means returns when no longer actuated for said travel and whereat the machine is disengaged and comes to a halt, the double-safety arrangement comprising:
- an operating lever having a center neutral position and at least first and second travel positions for forward and rearward travel, respectively; and,
- a latching assembly movable into a latched condition for transmitting the movements of said lever to said linkage means thereby actuating the latter and into an unlatched condition whereat said linkage means is no longer actuable by said lever;
- said latching assembly including:

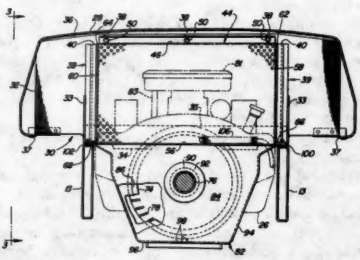


- connecting means movable between a first position for mechanically connecting said operating lever to said linkage means for transmitting said lever movements thereto and a second position whereat said lever movements are no longer transmittable to said linkage means;
- deadman's handle means movable to an actuating position for holding said connecting means in said first position so long as said handle means is held in the actuated position thereof by the operator; and,
- override shutoff means for acting on said connecting means while the same is in said first position thereof to cause the latter to move into said second position thereby interrupting the connection between said lever and said linkage means and causing the latter to return to its neutral position whereat the machine is disengaged and comes to a halt.

4,573,544
COOLING AIR DUCT AND SCREEN ARRANGEMENT FOR AN AIR COOLED ENGINE

John J. Hoch, Beaver Dam, and David K. Stricker, Juneau, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jan. 25, 1984, Ser. No. 573,774
Int. Cl.[4] B60K *11/06*
U.S. Cl. 180—68.1 7 Claims



1. In combination with a vehicle including a fore-and-aft extending main frame, an operator's station located about

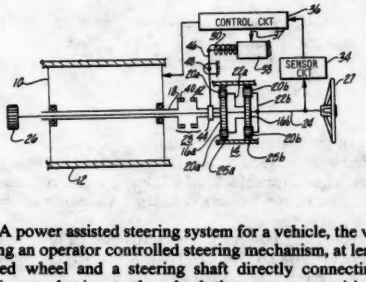
midway between opposite ends of the frame, and air cooled engine mounted to the frame at a location behind the station and including a cooling shroud having a forwardly disposed inlet located at a level below said station, and a hood extending over said engine and having an inverted U-shaped forward end terminating at a location forwardly of said cooling shroud, an improved cooling air system for ensuring a supply of relatively clean air for ingestion by the shroud, comprising: a vertical transverse baffle mounted to the frame and fitting closely against a forward top portion of the shroud and having an edge shaped complementary to and disposed at least closely adjacent the hood; an air duct mounted to the frame and having an upright rear wall seated against the front of the shroud in an area surrounding said inlet; said air duct further having an upright front wall and a connecting wall joining respective side and bottom edges of the front and rear walls and cooperating therewith to define an upwardly facing opening; a screen located forwardly of the baffle and having a top and front joined by opposite sides with the top and opposite sides having rear edges mounted against said baffle and with the opposite sides and front having bottom edges engaged with said air duct about said upwardly facing opening wherein said screen is mounted solely to said baffle by connection means including a vertical guide means provided on the forward side of said baffle and flange means formed on said screen and being vertically slidably received in said guide means, whereby said screen may be slid vertically away from said baffle for being cleaned.

4,573,545

FAIL-SAFE DEVICE FOR AN ELECTRICAL POWER ASSISTED STEERING SYSTEM INCLUDING AN IN-LINE CLUTCH MECHANISM

Ilmars Kalns, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1984, Ser. No. 646,372
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **7 Claims**



1. A power assisted steering system for a vehicle, the vehicle having an operator controlled steering mechanism, at least one steered wheel and a steering shaft directly connecting the steering mechanism to the wheel, the system comprising:

a bidirectional electric motor;

control means for energizing the motor to turn in a first direction when the steering mechanism is moved in one direction by the operator, for energizing the motor to turn in a direction opposite said first direction when the steering mechanism is moved in a direction opposite said one direction by the operator, for monitoring the operational condition of the system to detect malfunctions, and for generating a signal indicative of the operational condition system;

a gear reduction means connected between the motor and the steering shaft for increasing the torque delivered to the steering shaft by the motor;

clutch means, responsive to the control means, for coupling the motor to the ratio reduction means when the system is operating properly and for isolating the motor from the ratio reduction means when the system is not operating properly, and

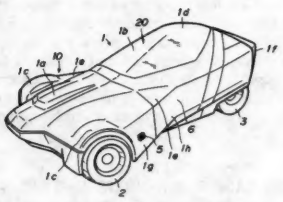
the clutch means including a first clutch half and a coaxial second clutch half, the first clutch half being axially mounted on the motor armature for rotation therewith, second clutch half being axially mounted on the gear reduction means for rotation therewith, and further including means, responsive to the control means, for moving one of said first or second clutch halves into frictional contact with the other of said first or second halves when the system is operating properly.

4,573,546

THREE-WHEELED MOTOR VEHICLE

Shoichiro Irimajiri, Mie; Katsusuke Komuro, and Kunihiko Aikawa, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,403
Claims priority, application Japan, Apr. 28, 1983, 58-73741; Apr. 28, 1983, 58-73742; Apr. 28, 1983, 58-73743; Apr. 28, 1983, 58-73744; Apr. 28, 1983, 58-63056[U]; Apr. 28, 1983, 58-63057[U]; Apr. 28, 1983, 58-63060[U]
Int. Cl.[4] B62D *21/00, 61/06*
U.S. Cl. 180—89.1 **7 Claims**



1. A three-wheeled motor vehicle comprising:

(a) a vehicle body;

(b) two front wheels rotatably mounted on said vehicle body;

(c) a single rear wheel rotatably mounted on said vehicle body;

(d) an engine disposed on said vehicle body between said front wheels;

(e) a driver's compartment defined in said vehicle body;

(f) said vehicle body including a front portion covering said engine and said front wheels and a rear portion disposed behind said front portion and covering said compartment and said rear wheel, said front portion having a relatively wide and flat shape and said rear portion being narrower than said front portion and progressively higher in a rearward direction for a substantial proportion of said rear portion; and

(g) said vehicle body also including lateral wing portions on each side extending longitudinally rearwardly from behind the front wheels and tapering into said rear portion for causing the said vehicle body to have a substantially constant cross-sectional area throughout a substantial proportion of both said front and rear portions and the transition between said front and rear portions for producing an aerodynamically improved vehicle body shape.

4,573,547

AUTOMATIC RUNNING WORK VEHICLE

Shingo Yoshimura; Katsumi Ito, and Shigeru Tanaka, all of Osaka, Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 13, 1983, Ser. No. 560,834
Claims priority, application Japan, Jun. 28, 1983, 58-118744; Jun. 28, 1983, 58-118745; Jul. 18, 1983, 58-130428
Int. Cl.[4] B62D *1/26*; G06K *11/02*
U.S. Cl. 180—168 **12 Claims**

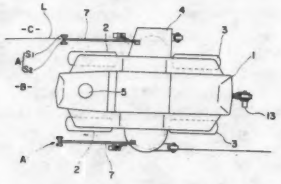
1. An automatic running work vehicle having a vehicle body

provided with front and rear steerable wheels for treating areas along a boundary between treated and untreated areas on a surface, said work vehicle comprising:

foller sensor means for detecting said boundary;

orientation sensor means for detecting a running orientation of said vehicle;

signal generating means for determining a deviation of said running orientation from a preset reference orientation and for generating a first signal when said deviation is



within a permissible angle and a second signal when said deviation is beyond said angle;

steering control means for causing said front and rear wheels to steer said vehicle body toward said boundary by steering all said wheels in the same direction in response to said first signal, and by steering respective wheels in different directions to each other until said deviation falls within said permissible angle in response to said second signal, and by returning said wheels to neutral positions when said follwer sensor means detects said boundary.

4,573,548

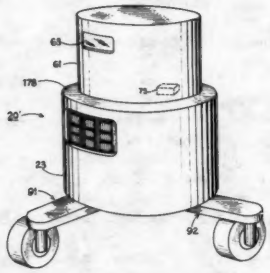
MOBILE BASE FOR ROBOTS AND THE LIKE

John M. Holland, Shawsville, Va., assignor to Cybermation, Inc., Roanoke, Va.

Filed Sep. 23, 1983, Ser. No. 535,168

Int. Cl.[4] B62D *57/00;* **B60B** *39/00*

U.S. Cl. 180—211 **23 Claims**



1. A carriage system for movement on a surface comprising:

(A) a base;

(B) a plurality of wheel assemblies, each including an axle, a wheel connected to the axle at one end, the wheel having a radius (r), a first bevel gear connected to the axle at a second end thereof so as to rotate the axle and wheel, the first bevel gear having a plurality of teeth, N1, facing toward the wheel connected to the axle, where N1 is an integer, a second belve gear, having a plurality of teeth N2, where N2 is an integer, the second bevel gear perpendicularly engaged with the first bevel gear so as to impart rotation to the first bevel gear and so as to define a wheel pivot radius (r') for the wheel as the distance between the center of the second bevel gear and the wheel perimeter that contacts the surface upon which the carriage system moves, wherein the ratio of the teeth of the second bevel gear to the teeth of the first bevel gear (i.e., N2/N1) is substantially the same as the ratio of the wheel pivot radius to the wheel radius (i.e , N2/N1=r'/r), a shaft connected at one end to the second bevel gear for rotation thereof, and a cylinder positioned about the shaft and the first and second bevel gears so that rotation of the cylinder causes steering of the axle, a steering sprocket connected to the upper end of the cylinder, and a drive sprocket connected at the second end of the shaft connected to the second bevel gear so as to impart rotation of the shaft;

(C) means connected about the steering sprocket of each cylinder so as to simultaneously turn each steering sprocket;

(D) means connected about the drive sprockets so as to simultaneous axially rotate each drive sprocket;

(E) first means for powering said turning means; and

(F) second means for powering said axial rotation means;

whereby simultaneous steering and axial rotation of the wheels associated with each of the wheel assemblies is effected and further wherein steering of the wheel assemblies can be achieved without translation of the wheel assemblies while allowing the wheels to rotate about their axes without slippage.

4,573,549

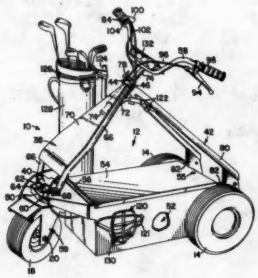
PORTABLE GOLF CAR

Arnold A. Pankow, 1201 Westmore, Wahpeton, N. Dak. 58075

Filed Sep. 7, 1983, Ser. No. 529,974

Int. Cl.[4] B62D *61/06*

U.S. Cl. 180—216 **24 Claims**



1. A golf car apparatus, comprising:

(a) a frame supported off the surface of the ground by at least three wheels, two of said wheels being positioned near the back end of the frame and being interconnected by an axle;

(b) a DC battery power source interconnected to an electrical motor, said DC battery power source and said electrical motor being supported by said frame;

(c) a drive mechanism interconnected to said electrical motor, said drive mechanism including a differential mechanism positioned near the center of said axle interconnecting said two back wheels;

(d) foot support means defined by said frame on either side of said differential mechanism and extending under said axle for positioning of said user's feet, said user's feet extending at least partially under said axle and positioned in said foot support means;

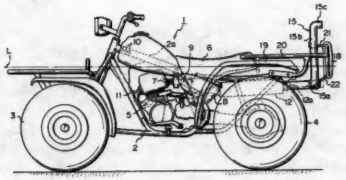
(e) a collapsible steering column assembly including handlebars interconnected to a front wheel by universal joint means, said universal joint means including movement limiting means limiting the angle the front wheels can be turned to the left or right; and

(f) a collapsible support structure for supporting said steering column in an upright position, said support structure being releasably interconnected to said steering column assembly to enable said steering column assembly and said support structure to be collapsed on to said frame.

4,573,550
EXHAUST PIPE APPARATUS FOR VEHICLE

Fumio Inomata, Saitama, and Kazuharu Wakusaka, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,636
Claims priority, application Japan, Feb. 8, 1984, 59-16543[U]
Int. Cl.⁴ B60K *13/04*
U.S. Cl. 180—296 **3 Claims**



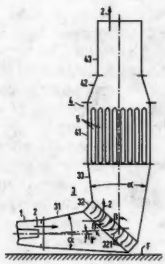
1. An exhaust pipe apparatus for a vehicle in which an exhaust pipe for an engine is disposed below an occupant's seat, comprising:

an auxiliary exhaust pipe having a bent portion which is bent at a substantially right angle with respect to an axis of said exhaust pipe, said auxiliary exhaust pipe being water-tightly connected to a rear end portion of said exhaust pipe in such a manner that said auxiliary exhaust pipe is pivotable between a reclining position where the pipe is reclined below said seat and an erect position where the pipe is erected above said seat.

4,573,551
EXHAUST GAS DUCT FOR GAS TURBINES

Otto v. Schwerdtner, and Klaus Dinstuhl, both of Müilheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,556
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206626
Int. Cl.⁴ B64F *1/26*
U.S. Cl. 181—218 **2 Claims**

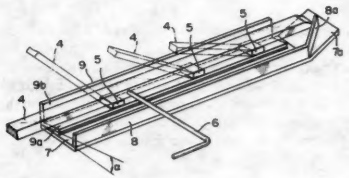


1. Exhaust gas duct for gas turbines, comprising an axial discharge housing, a deflection piece connected to and downstream of said axial discharge housing in exhaust gas flow direction having a steadily increasing cross section in exhaust gas flow direction for reducing the flow velocity of the exhaust gas and the outlet losses of the gas turbine, said deflection piece having a substantially flow-horizontal first conical diffusor section and a substantially vertical second conical diffusor section for reducing the overall horizontal extent of the exhaust gas duct, said first and second diffusor sections being formed from a single circular conical diffusor having a single inclined cut formed therein, said first conical diffusor section having a downstream and with a first inclined edge, said second conical diffusor section having an upstream end with a second inclined edge facing said first inclined edge, a grid in the form of an intermediate piece with an elliptical cross section disposed in said deflection piece for reducing the flow velocity of the exhaust gas and the outlet losses of the gas turbine, said grid being disposed between said first and second conical diffusor sections and being welded to said first and second inclined edges for redirecting exhaust gas flow into the vertical direction and into said second conical diffusor section, a substantially vertical exhaust gas chimney disposed downstream of and connected to said second conical diffusor section in exhaust gas flow direction, and a noise suppressor disposed in said exhaust gas chimney being protected by the reduced flow velocity.

4,573,552
SAFETY DEVICE FOR PROTECTING FALL OF A LIFT

Hiroyasu Aoki, Shizuoka, Japan, assignor to Yasui Sangyo Co., Ltd., Shizuoka, Japan

Filed Jul. 25, 1984, Ser. No. 634,167
Int. Cl.⁴ B60S *13/00*
U.S. Cl. 187—8.5 **7 Claims**



1. A safety device for protecting fall of a lift for vehicles, which comprises an elevating mechanism being provided at its upper end with cradles for supporting a vehicle under its lower part, said safety device including a stopper shaft being pivoted at one end to the upper end of the elevating mechanism and adapted for at another free end in engagement with a horizontal extending rack when the cradles is raised up to a desired operative position, characterized by that:

a passage for the free end of the stopper shaft to move along the rack when the lift is let down is formed beside the rack,

a first guide means is provided to said passage to lead said free end of the stopper shaft to a resting position on an extension of the rack where the cradles is at the lowermost position, and

said stopper shaft is pivoted to said upper end part of the elevating mechanism with sufficient flexibility to be allowed for lateral movements, and is also provided in the middle with a lever which projects laterally from the shaft, so as to bring said free end into said passage.

4,573,553
DISC BRAKE

Julius Nadas, Eching, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

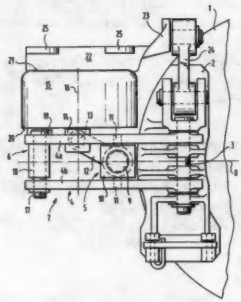
Filed Jul. 20, 1984, Ser. No. 632,928
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326372
Int. Cl.⁴ B61H *5/00*
U.S. Cl. 188—59 **8 Claims**

1. Disc brake for rail vehicles, with a brake clamp (7) arranged in a plane (8) and clampable by means of a brake cylinder (15) having a piston rod (14) and comprising two brake levers (4) carrying brake shoes (2) at their ends facing the brake disc, said brake levers being articulated to one another in their central regions by means of a pull rod (5) adjustable for longitudinal play and actuated by said brake cylinder, wherein

(a) said brake cylinder (15) is arranged in at least substan-

tially perpendicular axial direction (16) with respect to the plane (8) of said brake clamp (7) adjacent a central region of the latter;

(b) said piston rod (14) is coupled by way of a power ratio drive to a longitudinal adjustment element (9) of said pull rod (5), in such manner that actuation of said brake cylinder (15) causes shortening of said pull rod (5);



(c) means being provided for flexibly bracing the two ends of said brake levers; and

(d) said brake cylinder (15) held fast to the rail vehicle is provided with support means (22) on said brake cylinder (15) for pendulum suspension of said brake shoes (2) and rotatable mounting of the ends of said brake levers (4) remote from said brake disc.

4,573,554

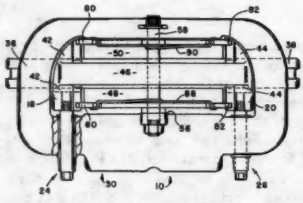
DISC BRAKE WITH CALIPER STABILIZING TIE-BAR

Irving R. Ritsema, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 538,605, Oct. 3, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,923

Int. Cl.⁴ F16D *55/224, 65/02*

U.S. Cl. 188—73.38 **2 Claims**



1. A disc brake comprising a torque member fixedly secured to a vehicle or the like adjacent a rotor to be braked, a caliper movably carried by the torque member and forming an inner leg on one side of the rotor, an outer leg on the other side of the rotor and a bridge extending axially between the inner and outer legs over an outer edge of the rotor, the caliper cooperating with a pair of friction elements to bias the latter into engagement with the rotor during braking, and a connecting member extending between the inner and outer legs to oppose deflection between the inner and outer legs, characterized in that said torque member includes a tie-bar extending circumferentially over a portion of the outer edge of said rotor and disposed axially between said pair of friction elements, said tie-bar cooperating by direct engagement with said connecting member to define an interface therebetween opposing static droop and dynamic lift when the inner leg of said caliper tends to move radially inwardly and the outer leg of the caliper tends to move radially outwardly, respectively, the tie-bar defining a radial spacing with the portion of the outer edge of said rotor and said connecting member extending through said radial spacing, the interface being formed by sliding engagement between only said connecting member and tie-bar and including an open arcuate recess in an open underside of said tie-bar forming a smooth, machined surface extending circumferentially over only a radially outer portion of the connecting member and facing radially inward, said connecting member extending into said recess so that the radially outer portion of said connecting member slidably engages directly said surface.

4,573,555

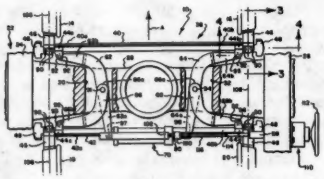
BRAKE RIGGING FOR A RAILWAY VEHICLE TRUCK

Jerome A. Malachowski, Hamburg, and James F. Horvatis, West Seneca, both of N.Y., assignors to Buffalo Brake Beam, Buffalo, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,957

Int. Cl.⁴ B61H *13/20*

U.S. Cl. 188—52 **23 Claims**



1. A brake rigging for a four-wheel type of railway vehicle truck having a frame with a longitudinal axis and a transverse axis, said rigging comprising:

two brake beams extending transversely of and movably supported by the truck frame, each of said brake beams defining two opposite end portions;

a brake cylinder assembly including a cylinder and a piston, said piston being slidably disposed in said cylinder;

two primary levers each having an effort arm portion and a response arm portion, the response arm portion of each primary lever being pivotally connected to a corresponding end portion of one of said two brake beams, the effort arm portion of each primary lever being pivotally connected to a corresponding one of said cylinder and said piston of said brake cylinder assembly; and

two secondary levers each having two end portions, one end portion of each secondary lever being pivotally connected to a corresponding end portion of the other of said two brake beams, the other end portion of each secondary lever being pivotally connected to a corresponding one of the primary levers intermediate the effort and response arm portions thereof so that when said brake cylinder assembly is actuated, said effort arm portions of said primary levers move relative to one another to move said two brake beams away from one another.

4,573,556

ACTUATOR FOR THE RELEASE OF AN AUTOMATIC EMERGENCY BRAKE OF A HAND-OPERATED POWERED TOOL

Bo C. Andreasson, Gothenburg, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 12, 1984, Ser. No. 599,730

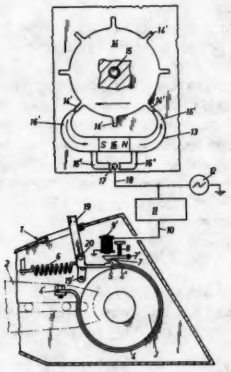
Claims priority, application Sweden, May 20, 1983, 8302885

Int. Cl.⁴ F16D *59/02;* **B27B** *17/02*

U.S. Cl. 188—137 **5 Claims**

1. An actuator for the release of an automatic emergency brake for hand-operated, powered tools, having a driving shaft for the tool in which the emergency brake is constituted of a brake mechanism at the driving shaft that is releasable by means of stored energy, comprising: a magnet, a sensor, an

actuator that is a rotatable balanced body with a small amount of friction on a shaft situated essentially parallel to said driving shaft and made of a permeable material having a mass presenting an essential inertia against rotation around the shaft, and wherein the actuator cooperates with said magnet retaining the



actuator with a predetermined magnetic force against rotation in an angular position of the actuator, and then with said sensor which is so adapted that an impulse for releasing the brake mechanism is given as soon as the actuator moves from said angular position.

4,573,557

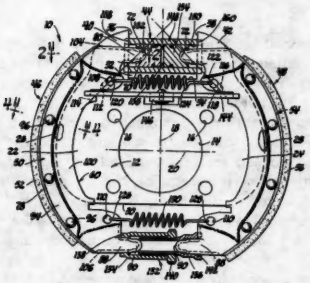
DRUM BRAKE

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 539,273, Oct. 5, 1983, Pat. No. 4,546,862. This application Jul. 18, 1985, Ser. No. 756,442

Int. Cl.⁴ F16D *65/14, 51/24*

U.S. Cl. 188—216 **1 Claim**



1. In a drum brake assembly having a backing plate, an opposed-piston wheel cylinder located in the plane of the backing plate, an adjuster mechanism located in the plane of said backing plate, said wheel cylinder and said adjuster mechanism being on a backing plate first diameter and diametrically opposite each other, a pair of brake shoe assemblies located in the plane of and on said backing plate and on a backing plate second diameter and diametrically opposite each other, the backing plate first and second diameters being perpendicular to each other, said brake shoe assemblies having adjacent first ends normally engaging the pistons of the wheel cylinder and having adjacent second ends normally engaging opposite ends of the adjuster mechanism, brake lining segments on the brake shoe assemblies adapted to engage a brake drum in friction braking relation when the wheel cylinder is energized, and spring means holding said shoe assemblies in operating position on said backing plate and relative to said wheel cylinder and said adjuster mechanism;

the improvement comprising;

said brake shoe assemblies being identical and substantially symmetrically formed about said second diameter, each of said brake shoe assemblies being formed of two identical sections each having a web portion and a rim portion, said sections having means securing said identical sections together,

a pair of oblong openings in said backing plate having their extended major axes forming acute angles with and intersecting said first diameter and intersecting each other radially outward of said wheel cylinder,

a first pair and a second pair of other openings in said web portions, said first pair of other openings being respectively aligned with said pair of oblong openings in overlying relation,

one of said spring means having opposed end hooks extending through said second pair of other openings and located adjacent said adjuster mechanism and another of said spring means having opposed end hooks extending through said first pair of other openings and said pair of oblong openings, said oblong openings acting as cam guides for said another spring means opposed end hooks and giving a return registry for said brake shoe assemblies.

4,573,558

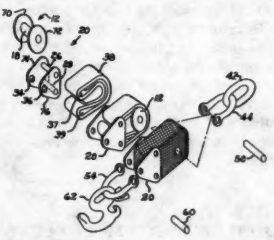
COMPACT SHOCK-ABSORBER FOR TIE-DOWN DEVICES

Der-Shi Wang, Mississauga, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 6, 1984, Ser. No. 618,008

Int. Cl.⁴ F16F *7/12*

U.S. Cl. 188—268 **20 Claims**



1. A shock absorber comprising:

a guide spool having two side plates connected by a spool shaft having an axial bore;

a guide bracket displaced from said guide spool having two side plates connected by a pair of spatially separated web shafts, each of said side plates having an anchor pin aperture axially aligned with each other; and

a continuous loop of webbing having its opposite end captivated by said spatially separated web shafts and its central portion looped over said spool shaft.

4,573,559

SUBWAY ELECTRIC MOTOR AND FAN CONSTRUCTION

Michael Shepherd, Carmel, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

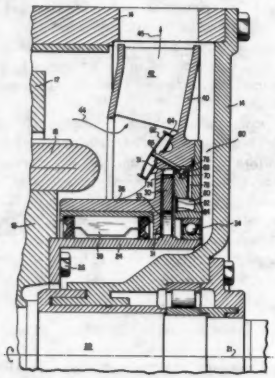
Filed Jan. 12, 1983, Ser. No. 457,462

Int. Cl.⁴ F16D *31/00*; H02K *9/06*

U.S. Cl. 192—58 B **4 Claims**

1. A temperature controlled fan fluid coupling for connec-

tion between an adjustable speed electric motor and a fan coupled to the motor armature interiorily of the motor, the motor having an armature, field and armature windings, and openings in the motor housing for the passage of air along and through the interior of the motor, wherein the motor is cooled by the fan whenever the motor ambient temperature exceeds a predetermined value, the coupling including a drive disc rigidly coupled to the motor armature for rotation therewith, the fan rigidly carried by a hub element, the latter having a drive chamber at least partially filled with a viscous shear fluid, the drive chamber receiving the drive disc, the fan rotating upon rotation of the drive disc by virtue of the shear liquid transmitting from the drive disc to the hub element, a reservoir chamber hydraulically coupled to the drive chamber, a fluid return path between a radially outermost part of the driving chamber and the reservoir chamber, a temperature responsive valve arrangement for blocking and for unblocking the fluid return path to thereby vary the amount of viscous shear liquid in the driving chamber and hence vary the amount of torque transmitted from the drive disc to the fan, a valve ball movable into and out of the fluid return path to thereby block and to unblock it, the valve ball held in one of its positions by centrifugal force upon rotation of the fan, the ball moved to its other position by the action of a temperature responsive device carried by the hub element.

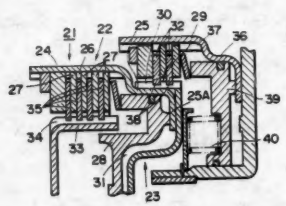


4,573,560

CLUTCH DRUM FOR MULTIPLE PLATE CLUTCH ASSEMBLY

Shinsuke Eguchi, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 22, 1983, Ser. No. 525,379
Claims priority, application Japan, Aug. 23, 1982, 57-144757
Int. Cl.[4] F16D *25/10*
U.S. Cl. 192—87.1 **11 Claims**



1. A clutch drum for a multiple plate clutch assembly having a first clutch including first clutch plates and a clutch piston, and a second clutch including second clutch plates, said clutch drum comprising:

a tubular body including a large diameter tubular section adapted to mount therein the first clutch plates, and a small diameter tubular section contiguous to said large diameter tubular section and adapted to slidably receive therein the clutch piston;

means, on said large diameter tubular section, for mounting the first clutch plates to said large diameter tubular section; and,

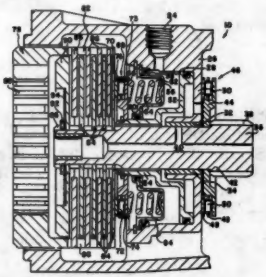
an end plug secured to said small diameter tubular section to sealably close one end of said small diameter tubular section, said end plug having a tubular flange, wherein said tubular flange is fit on the outer surface of said small diameter tubular section, and said tubular flange is formed with a plurality of axially extending slots serving as means for mounting the second clutch plates to said small diameter tubular section.

4,573,561

DRIVE MECHANISM

Brian C. Deem, Avon Lake, and John L. Hall, Middleburg Hts., both of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 23, 1983, Ser. No. 507,263
Int. Cl.[3] F16D *13/22*
U.S. Cl. 192—91 A **12 Claims**

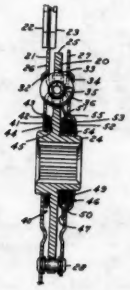


1. Drive mechanism comprising a housing defining a bore therewithin, output drive means rotatably supported by said housing for providing an output driving connection, input drive means for providing an input driving connection, clutch means for providing a driving connection between the input drive means and the output drive means when the clutch means is engaged and for breaking said driving connection when the clutch means is disengaged, resilient means yieldably engaging said clutch means, means for operating said clutch means, and means for communicating fluid pressure to said clutch operating means, said clutch means including clutch discs slidably mounted on said input and output drive means, abutment means carried by one of said drive means for engagement by said clutch discs, said resilient means forcing said clutch discs into driving engagement with each other and said abutment means to provide a driving connection between said input and output drive members, said clutch operating means including piston means slidably mounted in said bore and movable in response to fluid pressure to engage and disengage said clutch discs by controlling said resilient means, first bearing means for providing a rotary connection between the piston means and said clutch discs to permit rotation of the clutch discs while the piston means is restricted from rotation, and second bearing means between said one drive means and said housing for transmitting to said housing the load generated by said resilient means on said one drive means through said clutch discs.

4,573,562
CLUTCH DISC ASSEMBLY

Daniel L. DeLand, Alma, Mich., assignor to Alma Products Company, Alma, Mich.

Filed Aug. 1, 1983, Ser. No. 519,263
Int. Cl.⁴ F16D *3/14*
U.S. Cl. 192—106.2 **13 Claims**

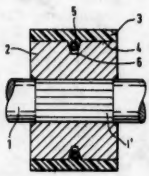


1. A clutch disc assembly comprising
a drive clutch hub having a radial disc,
a driven plate on one side of said disc,
a retainer plate on the opposite side of said disc and interconnected for movement with said driven plate,
said disc, driven plate and retainer plate having generally aligned openings,
first spring means in some of said openings,
second spring means in others of said aligned openings,
first stage friction means between said disc and said driven plate, and
second stage friction means comprising a thrust plate attached to said retainer plate and friction means interposed between said retainer plate and said thrust plate,
said second stage friction means comprising a fork, a lock washer on said hub and friction material interposed between said fork and said lock washer.

4,573,563
TRANSPORT ROLLER, ESPECIALLY FOR TRANSPORTING PAPER

Johannes C. Delhaes, Heerlen, Netherlands, assignor to Rubberen Kunststoffabriek ENBI, B. V., Nuth, Netherlands

Filed Jun. 19, 1985, Ser. No. 746,368
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424396
Int. Cl.⁴ B65G *39/07*
U.S. Cl. 193—37 **6 Claims**

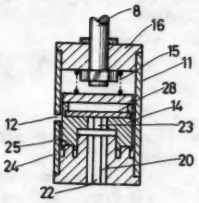


1. In a transport roller having a rotational axis and including a solid roller core and an elastic roller jacket surrounding said roller core with a radially inwardly directed biasing force, the improvement comprising radially outwardly open ring groove means in said rigid roller core, and helical endless spring means partially embedded in said elastic roller jacket, said endless spring means having a portion projecting radially inwardly from said elastic roller jacket and reaching into said ring groove means for anchoring said elastic roller jacket against displacement in the direction of said rotational axis.

4,573,564
TROLLEY LOCKING DEVICE

Frederik R. L. Rheeder, and Deon Dixon, both of Randburg, South Africa, assignors to Trailmor [Proprietary] Limited, Johannesburg, South Africa

Filed Apr. 19, 1984, Ser. No. 602,181
Claims priority, application South Africa, May 10, 1983, 83/3322
Int. Cl.⁴ G07F *17/10*
U.S. Cl. 194—250 **9 Claims**



1. A trolley locking device comprising a lock unit (4) and a key member (6) releasably connectable thereto, the lock unit having a tubular body provided with rotation-inhibiting formations (24) therein and housing an axially movable and rotatable plug (14) in the interior thereof, the plug being biased towards engagement with the rotation inhibiting formations which in use retain the plug in one of at least a first and a second selected angular position in the absence of axial movement of the plug, the plug has a key-way (20), the key member being co-operable with said key-way whereby a rotational force is applied from the key member to the plug, the plug having a transverse coin receiving slot (13) and a recess (17) opposite the key on the side of the slot remote from the key-way in the plug, an access slot (12) in the tubular body positioned for alignment with the coin receiving slot in the plug in said first angular position of the plug relative to the tubular body to allow introduction or removal of a coin (28) in and from the slot, the access slot (12) being at least partially misaligned with the coin receiving slot in said second angular position of the plug, relative to the tubular body, the plug being movable axially by engagement of the key member to free the plug for rotation only when a coin is located in the coin receiving slot whereby axial movement of the key member is transmitted to the plug and said plug becomes rotatable by disengagement thereof from the rotation inhibiting formations, the key member being removable from the said lock unit with the plug in said second angular position with a coin in the coin receiving slot but being non-removable with the plug in the said first angular position of the plug, the recess opposite the key member serving to receive part of the key member in the absence of a coin being present in the coin or token receiving slot.

4,573,565
CHAIN CONVEYOR DRIVER CONSTRUCTION

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,841
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908683
Int. Cl.⁴ B65G *19/10*
U.S. Cl. 198—719 **2 Claims**

1. A driver for a chain conveyor adapted to run in a substan-

tially horizontal driven direction in a conveyor trough having opposite side guide walls extending in the driven direction, comprising:

a driver arm having an outer side portion;

a guide shoe horizontally pivotally mounted about a substantially vertical axis to said outer side portion and having an inner side face with a recess into which said outer side portion extends;

a substantially vertically connecting element detachably and pivotally extending through said outer side portion and detachably connected to said guide shoe for pivotally connecting said guide shoe to said driver arm;

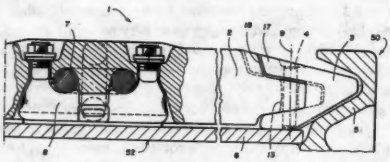
said guide shoe guided for motion in one of said side guide walls;

said driver arm and connected guide shoe being axially symmetrical about a vertical plane which is normal to said driven direction;

said guide shoe and said outer side portion having opposing surfaces therebetween for limiting pivotal movement of said guide shoes relative to said driver arm to a selected range;

said guide shoe having outer end surfaces defining forwardly facing and rearwardly facing cutting surfaces in said driven direction;

said guide shoe pivoting within said selected range and with movement in said driven direction to a predetermined scrape angle between the forwardly facing cutting surface



and a transverse line to said driven direction and a predetermined guide clearance angle between the rearwardly facing cutting surface and said driven direction;

said driver arm outer side portion being tapered outwardly and said guide shoe recess being tapered inwardly and substantially conforming in shape to said outer side portion, said recess being larger in cross-section than said outer side portion for establishing a predetermined clearance of motion between said guide shoe and said driver arm;

an outer surface of said outer side portion and a facing inner surface of said recess being circular, said vertical connecting element extending through said outer side portion and being connected to said guide shoe for permitting relative horizontal pivotal motion of said outer side portion and said guide shoe;

a pair of stop surfaces defined on said guide shoe and an opposing pair of stop surfaces defined on said outer side portion of said driver arm for limiting the pivotal movement of said guide shoe to said selected range; and

a projection extending from an upper surface of said guide shoe toward said driver arm, said driver arm having a U-shaped recess for receiving said projection of a size large enough to permit pivotal motion of said guide shoe through said selected range, said U-shaped recess of said driver arm having side walls which extend transversely to said driven direction, said stop surfaces of said driver arm formed adjacent said U-shaped recess.

4,573,566

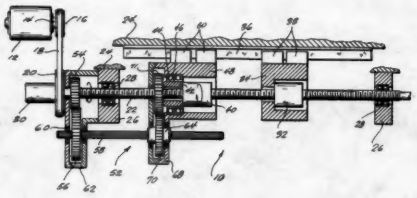
DUAL STROKE TRANSFER DRIVE

Horst L. Roman, Sterling Heights, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Jan. 13, 1984, Ser. No. 570,666

Int. Cl.[4] B65G *47/31*

U.S. Cl. 198—461 **11 Claims**



7. In a machine tool a transfer drive moving a first workpiece transfer bar over a first distance and simultaneously moving a second workpiece transfer bar over a second distance which is different from the first distance, the transfer drive of a type-having: a frame; a motor; a first carriage; means for mounting the first carriage for reciprocating movement relative to the frame; means for fixably joining the first carriage to the first transfer bar; a second carriage; means for mounting the second carriage for reciprocating movement relative to the frame; means for fixably joining the second carriage to the second transfer bar; and means for reciprocating the first carriage at a first rate related to the first distance and simultaneously reciprocating the second carriage at a second rate related to the second distance, wherein said means for reciprocating the first and second carriages comprises;

a first nut fixed to said first carriage;

a second nut;

means for rotatably mounting said second nut to said second carriage;

a driving screw engaging said first nut and said second nut;

means for rotatably mounting said driving screw relative to said frame;

means for controlling said motor to said driving screw to rotate said driving screw at a rate functionally related to said first rate of reciprocation; and

means for rotating said second nut comprising a first driving gear mounted for rotation with said driving screw; a rotatable first driven gear in meshed relationship with said first driving gear; a rotatable second driving gear; means connecting said first driven gear and said second driving gear for rotation in unison; and a second driven gear in meshed relationship with said second driving gear and joined for rotation in unison with said second ball nut, the ratio between said first driving gear and said first driven gear and the ratio between said second driving gear and said second driven gear being respectively selected to establish said second rotational rate of said second nut.

4,573,567

CONVEYOR HOUSING ACCESS PORT

Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.

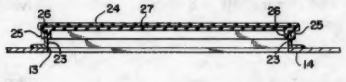
Filed Feb. 28, 1983, Ser. No. 470,238

Int. Cl.[4] B65G *21/00*

U.S. Cl. 198—860.4 **5 Claims**

1. A conveyor housing access port including an aperture defined in a conveyor housing wall, an upstanding flange disposed around the perimeter of said aperture, an elastomeric closure member defining a groove in the underside thereof around the entire periphery of said closure member, said groove adapted to receive said upstanding flange so as to effect a seal about the entire periphery of said aperture whereby said closure member is peelably removable, either partially or

totally, from any point on the periphery thereof and acts to cover and seal said aperture around substantially its entire periphery to thereby prevent the flow of material into or out of



said housing while, at the same time affording a partial exposure of the aperture for inspection without necessitating removal of the entire cover.

4,573,568

CHAIN FOR A FLIGHT CONVEYOR

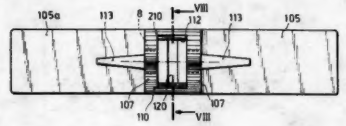
Wilhelm Maag, and Paul Straub, both of Oberuzwil, Switzerland, assignors to Gebruder Buhler AG, Uzwil, Switzerland

Filed Jun. 22, 1983, Ser. No. 506,723

Claims priority, application Switzerland, Jul. 22, 1982, 4480/82

Int. Cl.⁴ B65G *19/24*

U.S. Cl. 198—731 **6 Claims**



1. A removable flight attachment for a flight conveyor for feeding a load of material through a trough of predetermined width, a series of chain links each interconnected by a hinge bolt, said links having a stem and a wider body portion, said body portion having two sidewalls and an opening for receiving the next succeeding stem with said body portion and succeeding stem being joined by said hinge bolt passing through aligned apertures therein, said removable attachment comprising:

a frame having an opening sized to receive said wider body portion and a front face having an opening sized to receive said stem but not said wider body portion, including

a rest surface at least on the bottom portion of said frame in slideable engagement with said trough,

bearing walls attached to said frame and located on each side of said body portion, said bearing walls including apertures aligned to receive said hinge bolt,

a pair of lateral arms extending outwardly from said frame, and

a pair of cross pieces bridging said bearing walls to form together the enclosed frame.

4,573,569

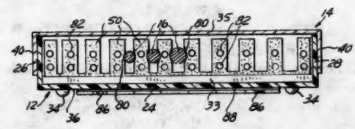
STORAGE AND DISPLAY CASE

Dolores V. Parker, 5042 Linda St., Venice, Fla. 33595

Filed Jun. 25, 1984, Ser. No. 624,275

Int. Cl.⁴ B65D *5/52*; B05C *17/00*

U.S. Cl. 206—1.7 **4 Claims**



1. A storage and display case comprising a substantially rectangular open top enclosure, a substantially rectangular cover for said enclosure, said cover having a peripheral wall formed by a pair of parallel spaced-apart longitudinal sidewalls and a pair of parallel spaced-apart endwalls, and means for holding a plurality of elongated objects in said enclosure, said enclosure comprising a pair of hingedly connected portions each having a bottom wall and a pair of spaced-apart sidewalls connected by an endwall, wherein said means for holding a plurality of elongated objects comprises a slotted frame affixed between the sidewalls of one of said enclosure portions, said slotted frame having two substantially parallel spread-apart rail portions and a plurality of slats integrally interconnecting said rail portions at spaced-apart intervals, and a row of grippers disposed substantially parallel to said slotted frame and formed of a single piece of compressible, deformable and resilient material having spaced-apart projecting portions, at least one bore extending transversely through each of a pair of adjoining projecting portions for locally increasing the compressible deformation of said adjoining projecting portions when laterally elastically gripping an elongated object placed therebetween, whereby said enclosure is adapted for placement within the upturned cover in a hinged position with the endwalls of said enclosure portions abutting the longitudinal sidewalls of the cover and at least one of said elongated objects gripped between a pair of adjoining gripper projecting portion, an end of said elongated object being held between a pair of adjacent slats on said slotted frame.

4,573,570

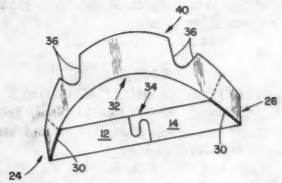
TACO SUPPORT

Jeffery J. Cortopassi, Santa Anna, Calif., assignor to Taco Bell, Irvine, Calif.

Filed Jun. 22, 1984, Ser. No. 623,477

Int. Cl.⁴ B65D *65/16*

U.S. Cl. 206—45.33 **8 Claims**



1. A structural support for a taco, for protecting the taco when packaged in a wrap, and also serving as a taco stand to maintain an unwrapped taco in an upright position, comprising an elongated support member formed into a closed structural support having a relatively flat base and a forwardly projecting bowed front, said elongated support member being folded upwardly through approximately 90° from said flat base along a first pair of angled fold lines and then being folded through approximately 180°, along a second pair of angled fold lines at each of two rear corner locations, into the forwardly projecting front, with the forwardly projecting bowed front being in the general shape of, but slightly larger than, a side profile of a taco, such that a taco can be placed on its side on said flat base and within the forwardly projecting bowed front, with the taco being protected thereby for wrapping, and said elongated support member also having a top edge defining a pair of opposed upwardly facing cutouts therein positioned on opposite sides of said projecting bowed front, whereby a taco can be placed in and supported upright by the opposed cutouts such that the structural support also serves as a taco stand.

4,573,571

PENCIL CASE

Tae Y. Leem, Flat 52-204, Walker Hill Apt., Kwangjang-dong, Sungdong-ku, Seoul, Rep. of Korea

Filed Oct. 5, 1984, Ser. No. 658,031
Int. Cl.[4] A45C *11/34;* B65D *69/00*
U.S. Cl. 206—214 5 Claims

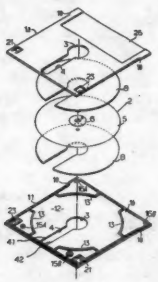
1. A pencil case comprising a cylindrical body member having upper and lower ends, a removable first cap for the upper end of the body member, the lower end of the body member being formed with an internal circumferential thread and the case further including a second cap for the lower end of the body member, the second cap having an outer circumferential thread complimentary to the internal thread of the body member for threading the cap into and out of the lower end of the body member, the second cap having a central internal protrusion defining an internal annular base wall portion around the protrusion for the receipt of on-end pencils and a central wall portion above the base wall portion for the receipt of further on-end pencils at a higher level than the pencils received on the annular portion, the second cap further being provided with engagement means for manually threading the second cap into and out of said body member to raise and lower the pencils in the case.

4,573,572

RECORDING DISC CARTRIDGE

Yoshitake Kato, Ibaragi, and Mitsuaki Naoi, Tokyo, both of Japan, assignors to Hitachi Maxell, Ltd. and Matsumi Electric Co., both of Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,355
Claims priority, application Japan, Aug. 24, 1983, 58-155233
Int. Cl.[4] G11B *23/02*
U.S. Cl. 206—303 6 Claims



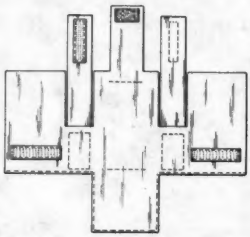
1. A recording disc cartridge which comprises a disc case composed of a top case half and a bottom case half each half being provided with peripheral walls, a drive shaft insertion hole defined at the central portion of said disc case and a head insertion hole defined on a portion apart from said drive shaft insertion hole in a frontward direction at the central portion of the disc case relative to the left and right direction, each of said top half and bottom half of said disc case being provided with at least one pair of connecting bosses in such a manner that the connecting bosses of one half are engageable with the corresponding are disposed in symmetrical positions relative to a phantom line passing through the center of the head insertion hole and the center of the drive shaft insertion hole said head insertion hole communicating with said drive shaft insertion hole.

4,573,573

PROTECTIVE COVERING FOR PORTABLE AUDIO DEVICES

Lori Favaro, 56 Briarcliffe La., Bourbonnais, Ill. 60914

Filed Jan. 2, 1985, Ser. No. 688,180
Int. Cl.[4] A45C *11/00;* B65D *65/06*
U.S. Cl. 206—305 11 Claims



1. A one-piece flexible cover for a personal audio unit, said cover comprising adjustably dimensioned panels having an inner and an outer layer of material with one layer of shock-absorbing material located thereinbetween, said adjustable panels including: a rectangular back panel, lower left and lower right side panels flexibly attached to opposite sides thereof, rectangular front panels flexibly attached to each of said lower left and lower right side panels, elongated edge panels attached to each of said lower left and lower right side panels and an elongated closure member attached to the top of said back panel whereby the flexible cover allows for flexible attachment hinges which may be located as best required to fit said audio unit, the cover further including:

first fastening means on said back panel which releasably attach said back panel to one of said front panels;

second fastening means on said front panels which releasably attach each said front panel to each other;

third fastening means on said edge panels which releasably attach each said edge panel to each other; and

fourth fastening means on said closure member and on one of said front panels which releasably attach said closure member and such front panel to each other wherein each said fastening means provides dimensional variability in that a plurality of sizes of audio units may be effectively contained by said cover.

4,573,574

AXIAL LEAD COMPONENT PACKAGE WITH WAX RETAINING MECHANISM

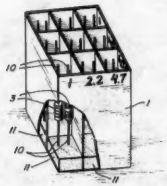
Colin A. Connery, c/o SALSA, P.O. Box 1296, New York, N.Y. 10009

Filed Jun. 25, 1984, Ser. No. 624,286
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 2 Claims

1. An array of axial lead components stored in a container from which individual components can be removed as desired, which comprises:

(a) a plurality of axial lead components including at least two portions, each of said portions including only components having a selected parameter, such as resistance, of a particular predetermined value, said value being different from the predetermined value of said selected parameter for the components in each of the other portions of said plurality of components, said components, including the axial leads at both ends of each component, all being elongated in over-all shape and having substantially the same length; and

(b) a container including a rectangular box, open on one face and partitioned into a plurality of elongated cells at least equal in number to the number of said portions of said plurality of components, said elongated cells being parallel to each other and at a right angle to the open face of the box, said cells being open at their top ends adjacent to the open face of the box, the depth of each cell being approximately equal to said length of the stored components, each of said cells being filled to a predetermined depth at its closed, bottom end with a wax or wax-like substance previously melted to accept a component lead therein, said wax or wax-like substance having thereafter been solidified around said lead in contact therewith throughout the entire portion thereof previously inserted within said melted material to provide means for retaining said component in said cell, said component being removable manually from said solidified material by gripping the upper lead of the component with a suitable tool held in the user's hand.



4,573,575

NEEDLE PACKAGING

Siegmar Bergrath, and Fritz Kappertz, both of Wurselen, Fed. Rep. of Germany, assignors to Singer Spezialnadelfabrik GmbH, Wurselen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,649

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 8336978[U]

Int. Cl.⁴ B65D *85/24*

U.S. Cl. 206—380 **4 Claims**

1. A package for sewing machine needles or the like comprising a block of synthetic thermoplastic material formed by a first molding process with a plurality of elongated parallel sewing needle accommodating compartments opening on the same side of the block, each said compartments being bounded on both sides by a partition composed of thermoplastic material integral with that of said block, said compartments each being formed in the block deeper than the maximum diameter of the needles to be accommodated, and needle retaining lugs formed on said partitions so as to project into said needle accommodating compartments by a second molding process which deforms the thermoplastic material at the top of the partitions creating in each partition a localized recess of which the thermoplastic material is displaced into an adjoining compartment to form one of said lugs.

4,573,576

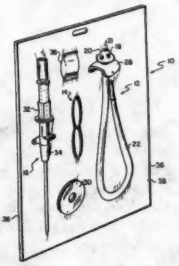
PERCUTANEOUS GASTROSTOMY KIT

Thomas C. Krol, 3344 Ironwood Dr., Oceanside, Calif. 92056

Filed Oct. 27, 1983, Ser. No. 545,827

Int. Cl.⁴ B65D *85/54*; A61M *21/00*

U.S. Cl. 206—471 **14 Claims**



13. A percutaneous gastrostomy kit comprising:

a sealable container;

a mushroom catheter of a unitary construction comprising an elongated elastic tube having a mushroom shaped head on one end thereof with a plurality of ports in said head, including one port aligned with the bore of said tube, said tube having a closed other end and a suture receiving transverse bore through said closed other end;

a quantity of about five feet of elongated No. 2 suture thread;

an inner sealing elastic washer for inserting on said tube adjacent said head;

an outer sealing elastic washer for extending over said tube;

a Medicut catheter of about 16 gauge; and

a packet of surgical lube;

4,573,577

STACKABLE CONTAINER

Daniel R. Miller, Cincinnati, Ohio, assignor to Buckhorn Material Handling Group Inc., Milford, Ohio

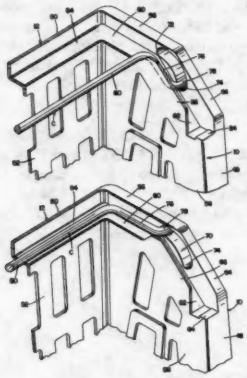
Filed Feb. 8, 1980, Ser. No. 119,799

Int. Cl.⁴ B65D *21/06*

U.S. Cl. 206—506 **5 Claims**

1. An open-top container having a bottom wall, side walls extending upwardly from opposite sides of said bottom wall, end walls extending upwardly from said bottom wall between said side walls, said side walls being constructed such that said container may receive an upper container of identical construction in nested relation therewith at a low level, and stacking means associated with said container for supporting an upper container of identical construction in stacked relation thereon selectively at a high level and at an intermediate level between the high and low levels, said stacking means comprising a pair of bales, and means mounting said bales on said container for movement from a first position adapted to support an upper container of identical construction at said high

level, to a second position adapted to support an upper container of identical construction at said intermediate level, and to a third position adapted to clear an upper container of identical construction for nesting at said low level, said mounting means comprising means on said end walls providing elongated slots near each end of each side wall, pins on the ends of



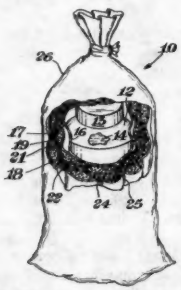
the said bales engaging said slots, means on said end walls for supporting said bales in said first position when said pins are engaged in one end of said slots, means on said end walls for supporting said bales in said second position when said pins are engaged in said one end of said slots, and means on said side walls for supporting said bales in said third position when said pins are engaged in the opposite ends of said slots.

4,573,578

METHOD AND MATERIAL FOR THE RESTRAINT OF POLAR ORGANIC LIQUIDS

George K. Greminger, Jr.; Richard H. Hall, and Mary K. Dehnke, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1983, Ser. No. 562,924
Int. Cl.⁴ B65D *85/84*
U.S. Cl. 206—524.4 **12 Claims**



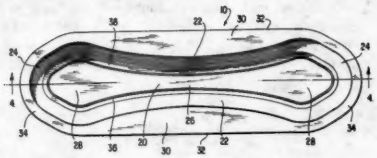
1. A device for restraining polar organic liquids comprising a means defining a first space containing a polar organic liquid, a second space from which polar organic liquid is to be excluded, and having at least one body of substituted cellulose disposed between the first and second spaces with the further limitation that in the event the polar organic liquid contacts the substituted cellulose, a liquid immobilizing gel is formed which thereby prevents the polar organic liquid from entering the second space.

4,573,579

TACO TRAY

Brian K. Murdick, Columbus, and William H. Haase, Dublin, both of Ohio, assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 525,751, Aug. 23, 1983, Pat. No. 4,535,891. This application May 24, 1985, Ser. No. 737,615
Int. Cl.⁴ B65D *1/34, 85/36*
U.S. Cl. 206—525 **1 Claim**



1. A tray adapted for holding a taco in an upright position, said tray comprising a base, integral side and end walls extending upwardly from said base and in combination with said base defining an elongated cavity adapted to receive a taco, and a reinforcing flange extending around one top of said cavity and integrally connected to said top and end walls, the side walls being inwardly bowed so that longitudinally central portions thereof are narrowed with respect to the opposite longitudinal ends of said cavity to thereby form a support for a taco, the side walls diverging upwardly from said base for wedgingly receiving therebetween a taco, the side walls at the ends of the cavity being wider than the side walls at the longitudinally central part of the cavity, wherein said base is enlarged at ends thereof to provide a stable support against overturning of the tray when a taco is positioned in it, the end walls being rounded in outline, the reinforcing flange being generally rectangular in peripheral outline, the base being reinforced by a downwardly offset peripheral rib, said rib also defining the supporting surface for said base, the ratio of the length of the cavity to the narrowest distance between the inwardly bowed side walls being greater than a factor of three, the ratio of the width of the widest part of the base ends of the cavity to the width of the narrowest part of the cavity being at least a factor of two, whereby a taco in the cavity is wedgingly engaged along a portion of its sides by at least the narrowest cavity portions defined by the inwardly bowed side walls of the cavity and a portion of the taco adapted to extend above the top of the cavity, and wherein the widest portions of the downwardly offset peripheral base rib, considered transversely of the longitudinal axis of the cavity, are wider than the widest portion of a taco adapted to be placed in the cavity, to thereby inhibit tipping over of the tray when a taco is placed in the cavity.

4,573,580

UNIT DOSE MEDICATION DISPENSER

Michelle Messer, 103 Archibald St., Kansas City, Mo. 64111

Filed Apr. 2, 1984, Ser. No. 596,110
Int. Cl.⁴ B65D *83/04*
U.S. Cl. 206—534 **2 Claims**

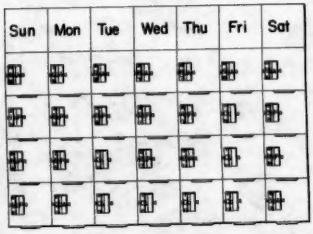
1. A unit dose medication dispenser to provide pills to a patient at preselected times of day, said dispenser comprising:

a rigid, rectilinear container comprised of rectangular receptacles arranged in rows of seven receptacles each, thereby presenting a matrix of rows and seven columns;

each receptacle being further comprised of a bottom, four upwardly extending sidewalls, and a liftable flat lid hingedly attached to the top of one of the sidewalls, each lid being provided with a tab to facilitate lifting of the lid;

means for designating each column with a different day of the week and each lid selectively with a time of the day before noon and after noon, wherein said means for designating each lid with the time of the day is comprised of a

subcompartment within each receptacle, first and second substantially parallel and vertically oriented wheels disposed within said subcompartment, and a substantially horizontally oriented spindle fixed within said subcompartment on which said wheels are rotatably mounted for independent rotation, the arcuate wall of said first wheel



further being imprinted with numbers representing the hours of the day, the arcuate wall of said second wheel being imprinted with letters representing a.m. and p.m., each lid being provided with a cut-away portion through which a single number in its entirety and a single letter in its entirety may be seen when said wheels are set to a desired time of day at which medication is to dispensed.

4,573,581

ENVIRONMENTALLY CONTROLLED MEDICATION CONTAINER

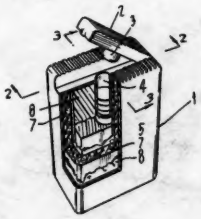
Howard R. Galloway, Adelaide, and Gary Shanks, Hawthorn, both of Australia, assignors to Network Medical Containers Pty, Ltd., Wayville, Australia

Filed Jul. 10, 1984, Ser. No. 629,454

Claims priority, application Australia, Jul. 18, 1983, PG0319

Int. Cl.⁴ B65D *81/38, 85/56;* **F25D** *3/08;* **A45C** *11/00*

U.S. Cl. 206—570 **7 Claims**



1. A container having an outer case and an inner chamber, and thermal insulating means in a cavity therebetween characterized in that the casing is of opaque rigid material, and the thermal insulating means includes a heat sink and a reflective and conductive shield surrounding the heat sink, whereby rise in temperature of the contents of the inner chamber following exposure of the outer casing to an increased temperature is delayed for a period sufficient to avoid deterioration of the contents of the chamber, under normal conditions of use.

4,573,582

RING SEAL TAMPER INDICATING DEVICE

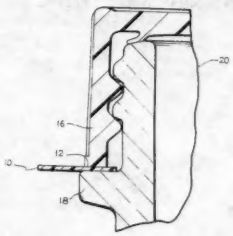
Maximillian Kusz, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 23, 1984, Ser. No. 602,790

Int. Cl.⁴ B65D *41/32*

U.S. Cl. 206—807 **14 Claims**

1. A ring seal for sealing the space between a container having a neck portion and a top opening and a closure therefor, the ring seal having a portion located externally of the neck of the container and the closure, the ring seal being away from the top opening, said ring seal having an adhesive on at least



one of its top and bottom surfaces whereby removal of the closure causes the ring seal to fracture or distort externally of the container to warn the user of prior tampering.

4,573,583

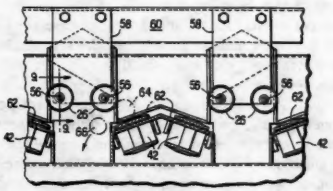
FRUIT SIZER

Gary O. Niemann, 3204 E. Lake Hartridge Dr., NW., Winter Haven, Fla. 33880

Continuation-in-part of Ser. No. 435,545, Oct. 21, 1982. This application Jan. 10, 1984, Ser. No. 570,074

Int. Cl.⁴ B07B *13/04*

U.S. Cl. 209—663 **3 Claims**



1. Apparatus for driving two objects in rotation about respective adjacent first and second parallel axes comprising a flexible drive belt, means for moving said flexible drive belt along its length, a first idler pulley mounted for rotation about a third axis of rotation parallel to and spaced from said first and second parallel axes, and a twisted idler pulley mounted for rotation about a fourth axis which is angled with respect to said first and second axes and parallel to a plane containing said first and second axes, wherein said flexible belt extends sequentially from said first idler pulley to (1) a first of said objects, (2) said twisted idler pulley, (3) a second of said objects, (4) to said first idler pulley.

2. Apparatus according to claim 1 wherein a centerline of the part of said drive belt extending from a first of said objects to said twisted idler lies in a plane parallel to a plane containing a centerline of the part of said drive belt extending from said twisted idler to said second of said objects.

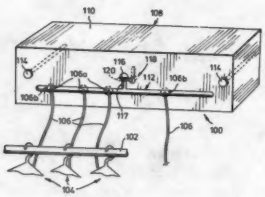
3. The apparatus of claim 2 wherein each of said objects is a sizing roller in a fruit sizing machine.

4,573,584

SECURITY DEVICE

Martin Otema, 51 Pine Ridge Dr., Scarborough, Ontario, Canada M1M 2X6

Continuation-in-part of Ser. No. 179,797, Aug. 20, 1980, abandoned. This application Aug. 11, 1981, Ser. No. 291,877
Int. Cl.[4] A47F 7/24
U.S. Cl. 211—4 12 Claims



1. A security device comprising:

a plurality of flexible elongate elements each adapted to retain at least one article to be secured;

an anchor member for said flexible elements, said anchor member being of relatively small dimensions so as to be capable of being secured in a fixed position and including an elongate undercut slot extending longitudinally of the anchor member;

said flexible elements having first end portions serially disposed in said slot, with the remainder of each element extending outwardly from said member and being of a length sufficient to permit the articles to be individually manipulated with respect to said member while remaining secured thereto by said elements, each said flexible element having an enlargement at its first end and said slot being dimensioned to permit free sliding movement of the flexible elements along the slot while preventing movement of the enlargements through the slot, said anchor member further including a release opening which is disposed intermediate the ends of the slot and communicates with said slot and which is of a size sufficient to permit movement of any of said enlargements therethrough so that the elongate elements in said slot can be moved serially past said opening until a predetermined element to be released from said anchor member reaches the position of the opening, whereby that element can be released without the need to first release preceding elements in said slot;

a plurality of article retaining members, each of which is attached to a second end portion of a respective elongate flexible element, is adapted for manipulation independently of the first end portion thereof and for retaining an article of clothing on that flexible element, and is independent of the respective first end portion when that first end portion is retained by the anchor member;

lock means coupled to said anchor member and including a lock member moveable between a locking position in which the member prevents movement of said elements from said slot to said release opening, and a release position permitting such movement of the elongate elements, said lock means being releaseable to permit movement of said lock member to said release position when authorized removal of articles to be permitted; and

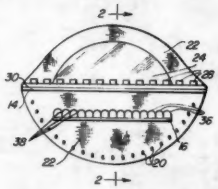
mounting means attached to the anchor member, for mounting and securing the anchor member in a fixed position, thereby to secure the flexible elements when their enlargements are locked in the anchor member.

4,573,585

JEWELRY DISPLAY

Linae Frei, 1343 Church St., Northbrook, Ill. 60062

Filed Dec. 3, 1984, Ser. No. 677,554
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—13 5 Claims



1. A jewelry display comprising:

a planar member having front and rear surfaces;

means on said rear surface for mounting said planar member to a vertical supporting surface;

shelf defining means attached to the front surface of said planar member, said shelf defining means having a plurality of spaced apart pegs attached to and extending upwardly from the upper surface thereof and a plurality of adjacent pillows attached to the upper surface thereof and defining jewelry receiving slots therebetween;

a plurality of spaced apart hooks attached to and extending outwardly from the front surface of said planar member; and

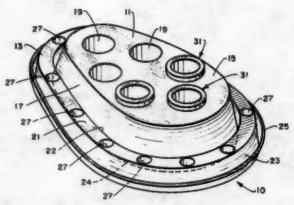
padding attached to and covering substantially the entire front surface of said planar member.

4,573,586

EASTER EGG DYEING AND DRYING DEVICE

Michael T. Helmer, 7517 Blackthorne Way, Citrus Heights, Calif. 95610

Filed May 2, 1983, Ser. No. 490,324
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—14 11 Claims



1. An Easter egg dyeing and drying device comprising a one piece rack having an upper portion and a lower portion,

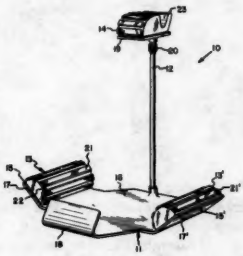
the upper portion including a top surface and a circumferentially continuous downwardly depending side wall, a single file of uniformly spaced apart dye wells spaced around the perimeter of the top surface each being directed downwardly from the plurality of locations along the top surface thereof,

the lower portion including a top surface, a downwardly depending lower inside wall, and a downwardly depending lower outside wall each of said downwardly depending walls being circumferentially continuous,

the bottom edge of the lower inside wall adjoining the bottom of the side wall of the upper portion to form a dye trap, a continuous flange extending upwardly from a bottom edge of said downwardly depending lower outside

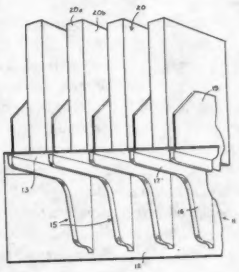
wall defining an edge trap between the upper portion and the lower portion,
the top surface of said lower portion being of a lower elevation than the top surface of the upper portion,
a plurality of egg receiving recesses at space intervals in single file, along the top surface of the lower portion,
said recesses being of smaller diameter than said wells.

4,573,587
TIRE DISPLAY STAND
John S. Matthews, Jr., Dearborn, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 4, 1984, Ser. No. 616,629
Int. Cl.[4] A47F 7/04
U.S. Cl. 211—24 **1 Claim**



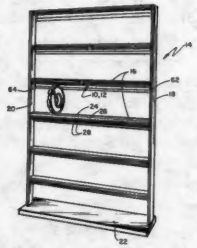
1. A tire display stand comprising:
(a) a base member comprising a single sheet of material having a pair of parallel edges, said single sheet being formed to define a flat horizontal central portion and a pair of end portions which each include one of said parallel edges, said end portions being inclined upwardly at acute angles in the range of 35° to 45° from a horizontal plane, a hook shaped projection extending along one edge of the base member substantially perpendicular to said parallel edges;
(b) an adjustable height vertical support member having a lower end that is attached by means for attachment to the central portion of said base member equidistant from said end portions, an upper end of said vertical support member having a generally horizontally extending platform attached thereto first means for attachment;
(c) an elongated elastomeric tread supporting member attached by second means for attachment to an upper surface of each end portion of the base member, each said tread supporting member having a longitudinal axis that is parallel to the parallel edge of said base member that is included in the end portion of the base member to which the tread supporting member is attached, each treat supporting member presenting an arcuate surface having an axis that is parallel to the longitudinal axis of the tread supporting member, said arcuate surfaces having a series of parallel grooves therein, said parallel grooves being oriented parallel to the longitudinal axis of the tread supporting member; and
(d) an elastomeric bead supporting member attached by third means for attachment to a top surface of said platform, said bead supporting member having an upper surface with a goove therein, said groove extending generally horizontally and being oriented perpendicular to vertical planes containing the longitudinal axes of said tread supporting members.

4,573,588
VIDEO SHELVING
Michael A. Cohen, 122 Canborough Cres., Pickering, Ontario, Canada
Filed May 26, 1983, Ser. No. 498,505
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—41 **15 Claims**



1. A display rack, comprising:
a vertical back wall portion;
a horizontal platform portion; and ribs;
where the ribs are arranged to stiffen and reinforce the said two portions and the junction between them;
where the back wall portion, the platform portion, the junction between them, and the ribs, are all formed integrally in and from one unitary piece of material;
where the ribs each have two respective side walls, arranged so as to create a hollow slot between the two side walls;
where the said side walls lie each in a respective substantially vertical plane;
where each of the said planes lies at an angle to the plane of the back wall portion of between 30 degrees and 45 degrees;
and where each of the said slots is provided with a respective divider which is dimensioned to fit tightly between, and be gripped by, the said side walls of the slot.

4,573,589
REEL STABILIZER AND EJECTION DEVICE
Walter E. Atkinson, Golden, Colo., assignor to Engineered Data Products, Inc., Denver, Colo.
Filed May 25, 1983, Ser. No. 497,910
Int. Cl.[4] A47G 19/08
U.S. Cl. 211—41 **3 Claims**



1. A reel stabilizer and ejection system for magnetic tape reel storage devices supported in side-by-side closely spaced relationship in a storage rack device having an access opening along a front side thereof comprising:
at least one longitudinally mounted elongated one-piece rigid shelf member fixedly mounted in a horizontal attitude be-

tween a pair of laterally spaced vertically extending support members of the storage rack device;

said elongated rigid shelf member having an uppermost horizontal flat rigid elongated flange portion and a forwardmost vertical flat portion and a forwardmost vertical flat elongated rigid flange portion;

a plurality of closely spaced apertures in said forwardmost vertical flat elongated rigid flange portion for support of the reel storage devices by insertion and removal of a reel hanger hook portions therefrom;

pivotal support means associated with each of said longitudinally spaced horizontally aligned aperture means for supporting engagement with the reel hook portions to hold the reel storage devices in a horizontal row in extending closely spaced adjacent vertical attitude beneath said shelf member and for enabling pivotal forward and rearward swinging movement of each reel device relative thereto;

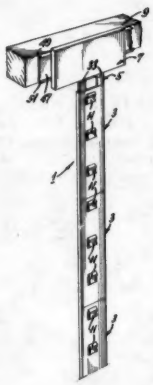
a one-piece elongated reel abutment member made of relative thin resilient flexible sheet material having a horizontally extending attachment uppermost flange portion fixedly inflexibly mounted on the bottom surface of said uppermost flat horizontal rigid elongated flange portion of said shelf member, a vertically downwardly extending flat intermediate flange portion resiliently pivotally connected along an upper edge portion to one side edge portion of said horizontally extending fixedly mounted attachment uppermost flange portion and being resiliently deflectably movable relative thereto between a normal vertically downwardly extending stationary position and a rearwardly displaced vertically rearwardly inclined position, and a downwardly rearwardly inclined lowermost flange portion having an upper edge portion resiliently deflectably connected along a horizontally extending connecting bend portion to said intermediate flange portion and being resiliently deflectably movable relative thereto between a first normal vertically downwardly rearwardly inclined position and a second rearwardly displaced vertically further rearwardly inclined position;

the construction and arrangement of said reel abutment member being such as to locate said inclined flat lowermost flange portion at an angle which is tangent to the periphery of said reel device and to establish substantially line contact abutting engagement between only a central flat surface portion of said lowermost flat flange portion and a peripheral portion of each of said reel devices supported by said pivotal support means and whereby in said normal position said reel devices hang downwardly in said normal stored position and whereby rearward swinging movement of any selected one of said reel devices by force selectively applied to the selected one of said reel storage devices causes resilient rearward displacement of said lowermost abutment flange portion by force applied at substantially a right angle to said surface of said lowermost flange portion without transfer of force to any other adjacent storage reel device and upon removal of said selectively applied force said lowermost abutment flange portion is moved forwardly from the deflected position to the normal position by only resilient compressive forces in said abutment member which are transferred to said selected storage reel device to cause outward swinging movement of said selected reel storage device about said pivotal support means a sufficient distance outwardly beyond adjacent reel storage devices to enable the side surfaces of selected reel storage device to be grasped for removal from said storage rack without corresponding engagement with and outward movement of the adjacent storage reel devices.

4,573,590
CLIP STRIP DISPLAY UNIT

Jeffrey Ellis, Spring Valley, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Dec. 26, 1984, Ser. No. 686,325
Int. Cl.⁴ A47F 5/00
U.S. Cl. 211—86 **6 Claims**



1. A clip strip display unit adapted to be mounted for displaying items in a multiplicity of fashions and to accommodate a variety of vertical spaces comprising:

(a) at least one vertical extender element; said vertical extender element being adapted to be removably secured to similar extender elements so as to be capable of varying the vertical dimension of the display unit; said vertical extender elements being provided with clip means for retaining items on the display unit;

(b) a hanger element removably secured to said extender element; said hanger element being adapted to be hung from a support to support said display unit; and

(c) an indicia element removably secured to said hanger element; said indicia element having a surface on which a written message may be applied; said indicia element also being provided with means for securing said clip display unit to a support.

4,573,591
MOLDED SHOWER SHELF

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Jan. 15, 1985, Ser. No. 691,644
Int. Cl.⁴ A47F 5/00
U.S. Cl. 211—113 **9 Claims**

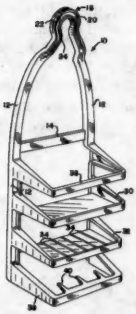
1. A one-piece shower shelf construction adapted to be suspended from an associated shower pipe extending from a wall, comprising:

a frame including a pair of spaced-apart generally vertical leg portions, and generally inverted U-shaped gripping means adapted to receive said shower pipe therein, the upper ends of said leg portions extending toward each other and being integrally joined to said inverted U-shaped gripping means,

said gripping means being configured to resiliently grip said shower pipe for arresting movement of said shelf construction relative to said shower pipe, said gripping means having an I-beam cross-sectional configuration including a central web and a pair of inner and outer flanges respectively joined to said web whereby said inner flange is adapted to engage said shower pipe for resisting movement of said shelf construction toward and away from said wall, said upper ends of said pair of vertical leg portions having a generally U-shaped cross-sectional configuration

merged into said I-beam cross-sectional configuration of said inverted U-shaped gripping means,

said gripping means being offset forwardly with respect to the substantial vertical extent of said vertical leg portions



to facilitate positioning of said shelf construction substantially adjacent to said wall; and

at least one shelf extending integrally between said leg portions of said frame for receiving and supporting articles thereon.

4,573,592

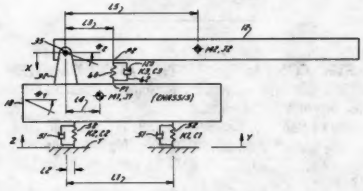
MEANS TO REDUCE OSCILLATORY DEFLECTION OF VEHICLE

Larry J. Oliphant, Swisher, Iowa, assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Continuation of Ser. No. 476,112, Mar. 17, 1983, abandoned. This application May 8, 1985, Ser. No. 732,891

Int. Cl.[4] B66C *23/26*

U.S. Cl. 212—182 **7 Claims**



1. A vehicle (10) movable across terrain (T) and comprising:

a first mass including a vehicle chassis (18);

resilient support means including terrain-engaging wheel assemblies (20) connected to said chassis (18) and enabling reciprocable vertical and angular deflection of said chassis (18) relative to said terrain (T) as said vehicle (10) moves thereacross;

a second mass including a load-handling boom component (12) carried by said chassis (18) and independently movable relative to said resilient support means, said first mass being greater than said second mass;

means for movably connecting said load-handling boom component (12) to said chassis (18) and enabling reciprocable vertical angular deflection of said component (12) relative to said chassis (18) as said vehicle (10) moves across said terrain (T);

and deflection reduction means connected between said chassis (18) and said load-handling boom component (12) to reduce vertical and angular deflection of said chassis (18) relative to said terrain (T) tending to occur in response to dynamic loads imposed on said vehicle (10) by movement across uneven terrain (T) or by acceleration or deceleration of said vehicle (10);

said deflection reduction means including resiliently compressible and expandable load-bearing spring means (60) connected between said chassis (18) and said load-handling boom component (12) and responsive to and tending to enable limited vertical angular deflection of said load-handling boom component (12) relative to said chassis (18) which would cause spring motion at a predetermined rate of speed in response to said dynamic loads, and said deflection reduction means further comprising damping means (62) connected between said chassis (18) and said load-handling boom component (12) and to said spring means (60) to reduce the rate of speed of spring motion as rapidly as possible to thereby dissipate said dynamic loads.

4,573,593

TOWER CRANE WITH HAMMER HEAD ADAPTATION

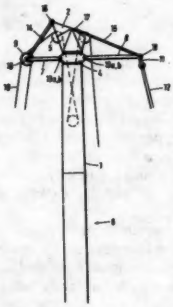
Joachim Lietzau, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 6, 1984, Ser. No. 668,734

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340845

Int. Cl.[4] B66C *23/64*

U.S. Cl. 212—239 **6 Claims**



1. In a lattice tower crane having a main boom, the boom having a tip element, there being a removable head for a deflection pulley, for the main boom, the combination comprising:

a flat boxlike intermediate element of high stiffness and matching in cross section a cross section of said tip element;

fastening means on the flat element respectively corresponding to fastening elements on the head and on the tip element by means of which the head and the tip element can be interconnected directly, for respective connection to the head and to the tip element to thereby being interposed between them;

a first traverse hinged on said flat intermediate element for pivoting about an axis transversely to the axis of said main boom;

a deflection pulley or sheave journalled on the unhinged end of said first traverse;

a second traverse hinged to said flat intermediate element about an axis transversely to the axis of said main boom and for extending in about a direction opposite a direction of extension of the first traverse;

means at the unhinged end of said second traverse for connection to holding a cable for the main boom; and

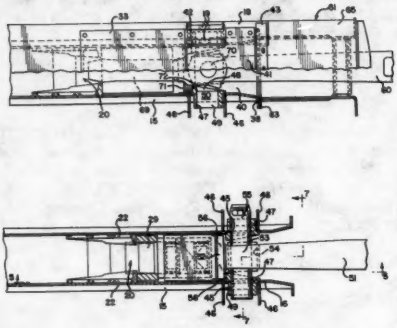
releasable tensioning means for connecting the respective unhinged ends of said first and second traverse to said head for holding the traverses in a deployed position, release of the tensioning means permitting holding of the traverses against the boom.

4,573,594

RAILWAY CAR UNDERFRAME ADAPTED FOR USE WITH COUPLE OR DRAWBAR CONSTRUCTION

Robert J. Kunst, Crown Point, Ind.; Gerald F. Lahey, Kenilworth, Ill., and Herbert S. Wille, Schererville, Ind., assignors to Pullman Standard, Inc., Chicago, Ill.

Filed Sep. 15, 1983, Ser. No. 532,448
Int. Cl.[4] B61G 7/10, 9/24
U.S. Cl. 213—51 **18 Claims**



18. In a railway car underframe including a center sill having upright spaced sill walls defining a cushion pocket having at one end thereof a cushion stop,

a cushion within said cushion pocket,

a drawbar supported on said underframe and projecting outwardly with respect thereto,

said drawbar having a laterally extending slot,

an impact head at one end of said drawbar engageable with said cushion,

a cheek plate assembly comprising a pair of vertical spaced cheek members respectively supported on said sill walls,

each of said spaced cheek members including a transversely extending slot with said slots being in registry with said drawbar slot,

a key extending through said slots,

said drawbar slot being longer lengthwise than said cheek plate slots,

said cheek members having inwardly projecting boss members having impact receiving surfaces facing the outward end of said cushion pocket,

said impact head having laterally spaced thrust surfaces engageable with said impact receiving surfaces during draft movement of said drawbar,

said pocket having an opening and a removable cover means providing access to the cushion pocket for replacement of the drawbar and the cushion with a coupler and a cushioning means for changing between drawbar and coupler operation.

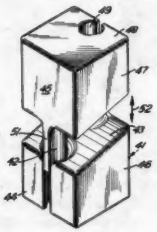
4,573,595

MATED CONTAINER UNITS

Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.

Filed Dec. 12, 1983, Ser. No. 560,597
Int. Cl.[4] B65D 21/02
U.S. Cl. 215—10 **23 Claims**

1. The combination comprising a pair of mated containers wherein (a) each container comprises a hollow body for containing the contents of the container including a polygonal front wall, polygonal rear wall, polygonal lateral side walls, a polygonal bottom wall and an upper shoulder forming at least a substantial portion of the top of the body opposite the bottom wall, a hollow elongated neck integrally connected to the body to permit a flow of the contents of the container from the body through and out of the end of the neck, the body including no more than a single recessed surface for receiving the neck of the other container of the pair of mated containers, said recessed surface extending from the shoulder for a distance at least as long as the neck and having a shape conforming to the shape of the neck, the recessed surface comprising an elongated opening interrupting the surface of the front wall; (b) the neck of each one of the mated containers being disposed within the recess of the recessed surface of the other one of the mated containers, with the end of each neck adjacent to the bottom wall of the other container, and the shoulder of each container being placed in contiguous relationship with the shoulder of the other container; (c) the neck having a length substantially



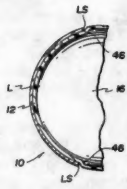
equal to the length of the body as defined by the distance between the bottom wall and the shoulder; (d) the mated containers forming a polyhedron substantially filling and occupying no more than the minimum rectangular polyhedral volume needed to encompass, the neck and body of a single one of the containers; (e) further comprising means for preventing lateral separation of the mated containers in a direction lateral to the axis of the neck; and (f) the neck including a surface conforming to the shape of the recessed surface and the neck further including a rear surface which, when containers are mated extends in alignment with the uninterrupted surface of the front wall of the other container.

4,573,596

PLASTIC CONTAINER WITH VAPOR BARRIER

William A. Slat, Brooklyn, Mich., assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Continuation of Ser. No. 433,536, Oct. 8, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 750,065
Int. Cl.[4] B65D 23/08
U.S. Cl. 215—12 R **5 Claims**



1. A container comprising: a side wall; an upper neck that extends upwardly from the side wall; a bottom that ends downwardly from the side wall to close the container; a label of a uniform thickness on the side wall of the container; said label extending partially around the side wall and having side edges spaced from each other; said label also having an upper edge located below the neck of the container and a lower edge located above the bottom of the container; said container side wall having abruptly curved portions adjacent the edges of the label to provide the container with a generally continuous outer surface at the junctions of the label edges with the side

wall; said label including a barrier for resisting the transmission of fluids through the container side wall; and a heat sensitive adhesive that secures the label to the container side wall.

4,573,597

CONTAINERS

John F. E. Adams, Caversham; Philip J. G. Proffit, Wantage; Nicholas R. Oakley, Swindon, and Rickworth Folland, Faringdon, all of England, assignors to Metal Box p.l.c., Reading, England

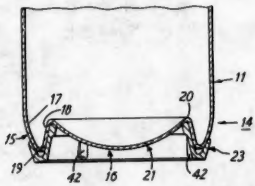
PCT No. PCT/GB83/00338, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/02508, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 20, 1983, Ser. No. 645,316

Claims priority, application United Kingdom, Dec. 23, 1982, 8236599

Int. Cl.⁴ B65D *25/24*

U.S. Cl. 215—12 R **12 Claims**



1. A thermoplastics container having a body with a standing base, the base being formed with a central recess and having a standing ring with a crest which defines the periphery of the recess, for controlling distortion of the base against internal pressure of the container, the container further including a ring member which receives the crest of the standing ring in generally nested relation, the ring member being of a thermoplastics material which is mutually weldable with that of the base, and the ring member being welded to the base radially outwardly of the crest but radially inwardly of the crest being free of the base so that the base is movable relative thereto, said ring member and base comprising means whereby, radially inwardly of the crest, the base is spaced from the ring member when the container is unpressurised, but moves into abutment with the ring member and is thereby supported against further distortion when the container is pressurised.

4,573,598

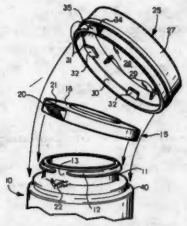
CHILD-RESISTANT PACKAGE WITH TAMPER INDICATING DEVICE

Robert A. Perry, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 29, 1985, Ser. No. 728,417

Int. Cl.⁴ H61J *1/00*; B65D *55/02, 85/56*

U.S. Cl. 215—204 **16 Claims**



1. A child-resistant package with a snap-on closure comprising

a container having a neck finish including an annular retaining bead having at least one notch therein,

a closure having a top and a peripheral skirt,

the skirt having a lifting tab on the outer surface thereof and a first radially inwardly extending locking lug on the inner surface thereof adjacent the external lifting tab,

a cover cap having a top wall and a peripheral wall placed over the closure,

the peripheral wall of the cover surrounding the peripheral skirt of the closure,

an annular band connected to the lower edge of the peripheral wall of the cover cap by weakened portions,

said band including a plurality of circumferentially spaced radially inwardly extending lugs that project beneath the free edge of the peripheral skirt of the closure so that the cover cap cannot be removed until the band is first removed by severing it from the closure cap,

indicia on the container and said closure that indicates proper alignment of the lug on the closure with the notch on the container,

said band normally obscuring the view of the indicia,

said cover cap normally obscuring viewing of the indicia on the closure.

4,573,599

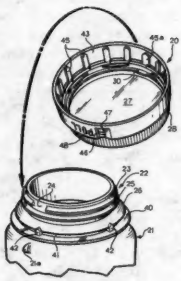
CHILD RESISTANT PACKAGE WITH TAMPER INDICATING BAND

William E. Fillmore, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 25, 1985, Ser. No. 704,844

Int. Cl.⁴ B65D *55/02*

U.S. Cl. 215—225 **15 Claims**



1. A tamper resistant child resistant package with a snap-on closure comprising

a container having a neck finish,

said neck finish including a retaining bead having at least one notch therein,

a closure having a top wall and peripheral skirt,

a radially extending lug on the inner surface of said skirt adapted to be aligned with said notch to permit removal of said closure,

an integral tamper indicating band connected to the skirt of said closure by means defining a weakened line,

a plurality of circumferentially spaced vertical ribs on the inner surface of said tamper indicating band,

a plurality of circumferentially spaced vertical ribs on the outer surface of said container below said retaining bead,

said ribs on said closure and said ribs on said container being arranged such that when the closure is snapped onto the container, the ribs interengage to position the closure in such a manner that the locking lug on the container can not be aligned with the notch on the container and prevent rotation of the closure to bring the locking lug into alignment with the notch until the band is removed.

4,573,600

SNAP CLOSURE FOR A CONTAINER

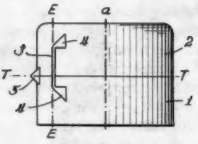
Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Dietlikon, Switzerland

Filed Jun. 7, 1984, Ser. No. 618,037

Claims priority, application Switzerland, Jun. 10, 1983, 3191/83

Int. Cl.[4] B65D *51/04*

U.S. Cl. 215—237 10 Claims



1. A molded synthetic material snap-closure for containers, including a lower part shaped to be fixed to a container and a cover swingably joined to said lower part, said lower part having a central axis, the swingable junction of said snap-closure being such that said cover and said lower part contact one another at a first side of said snap-closure during opening and closing thereof, and in which said cover in the closed position of the closure completely covers said lower part, whereby a contacting area between said lower part and said cover forms a separating plane (T) with said axis passing through said separating plane, and including at least one tensioning band integrally connected by lugs (4) to both said cover (2) and to said lower part (1), said lugs being arranged such that, in the closed state of the snap closure, said tensioning band is stretched along a straight line and lies in a plane (E) spaced from said axis, said plane (E) intersecting the separating plane (T) at a location spaced from said axis, said location being adjacent the first side of said snap-closure and said snap-closure being formed of one piece of said synthetic material.

4,573,601

SCREW CAP WITH SECURITY RING

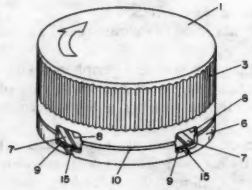
Jan Berglund, Västra Frölunda, Sweden, assignor to Wicanders AB, Sweden

Continuation-in-part of Ser. No. 526,030, Aug. 24, 1980, Pat. No. 4,505,401. This application Oct. 26, 1984, Ser. No. 665,024

Claims priority, application Sweden, Jun. 1, 1983, 8303099; United Kingdom, May 15, 1984, 8412344

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 18 Claims



1. A screw cap for a screw threaded container neck, the cap comprising an internally threaded cap portion having a head and a skirt extending from said head to a skirt edge, and further comprising a security ring adjoining said skirt edge and having an edge opposing said skirt edge, the security ring effectively constituting a continuation of said skirt, away from said head, beyond said skirt edge, at least one of said opposing edges of the skirt and the security ring having a plurality of recesses open towards the other side edge, said recesses being distributed around the circumference of the cap, the cap further including a plurality of bridge portions connecting the cap with the security ring, each said bridge portion being disposed in a said recess and extending from a respective first point on the security ring to a respective second point on the cap skirt which is located in advance of the respective first point in the rotational sence in which, according to the internal threading of the cap, the cap must be turned to screw it onto a container neck, whereby when the cap is screwed onto a container neck having a collar for engagement with said security ring, after the security ring engages said collar, further screwing on of the cap will cause the skirt edge of the cap skirt to press against the opposing edge of the security ring after, at most, relatively slight bending of the bridge portions at said first and second points, to allow the cap portion to force the security ring past said collar, whilst after the cap has been fully screwed onto a container and neck and is subsequently unscrewed therefrom, after the security ring engages said collar to be retained thereby, the bridge portions will be subjected to relatively great bending at said first and second points whilst being tensioned and thereby fractured, said security ring being further provided with weakening points at one or more of the bridge connections.

4,573,602

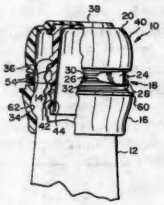
MOLDED SAFETY CLOSURE DEVICE AND METHOD FOR MAKING SAME

James R. Goldberg, 315 Grandview Ave., Novato, Calif. 94947

Filed Jul. 10, 1984, Ser. No. 629,369

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—256 4 Claims



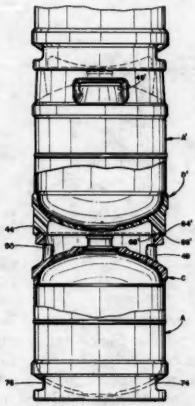
1. A molded safety closure device comprising, a cylindrical closure element adapted to close the mouth of a bottle or the like by frictional engagement with the interior facing surface of the mouth, a cylindrical retainer collar, and an intercoupling means connecting said collar to said closure element with said closure element and said collar extending substantially coaxially with each other, said intercoupling means comprising a unitary molded structure having a cup-like portion that is shaped to extend over the lip of the container, said intercoupling means further comprising a tether strip, said tether strip being integrally formed extending one or more turns from said cup-like portion to said collar, said tear strip being joined by a pair of frangible webs of a preselected thickness to permit said tether strip to be manually separated from the remainder of said intercoupling means, said closure element comprising a separate unitary molded structure and being secured to said intercoupling means about the periphery of one end of said closure element, said closure element and said cup-like portion having an annular weld securing said closure element to said cup-like portion of said intercoupling means about the periphery of one end of said closure element.

4,573,603

FLUID CONTAINER

Jeffrey T. Starling, Westerville, Ohio, and Bruce D. Jones, Lake Mary, Fla., assignors to Worthington Industries, Inc., Columbus, Ohio

Filed Jun. 3, 1985, Ser. No. 740,548
Int. Cl.[4] B65D *7/42*
U.S. Cl. 220—5 R 20 Claims



1. A container for fluid products comprising:
an inner shell of sheet metal which includes a substantially cylindrical body and top and bottom end walls;
a first resilient outer member encasing said inner shell bottom end wall and forming a base portion for the container, said first member including a substantially cylindrical side wall portion and a base portion, said base portion including a ring section, provided on its outer surface with a pair of spaced ribs, and a recessed inner section; and,
a second resilient outer member encasing said inner shell top end wall and forming a top portion for the container, said second member including a substantially cylindrical side wall portion and a top portion including a ring section, having a planar outer surface, and a recessed inner section, said second member ring section having a suitable width so that it is sized to fit between said first portion spaced pair of ribs to permit stacking of the container.

4,573,604

TILT FREE CONTAINER

Raûl Guim, 834 Venetia, Coral Gables, Fla. 33134

Filed Jul. 15, 1985, Ser. No. 755,097
Int. Cl.[4] B65D *23/00*
U.S. Cl. 220—69 3 Claims

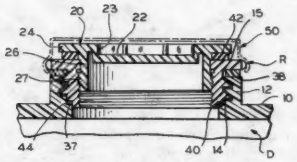
1. In a plastic container for liquids having a cylindrical bottle member having a rounded bottom and resting on a cooperating cylindrical base member, the improvement comprising:
a. skirt member peripherally mounted on said bottle member at a uniform predetermined distance from said bottom so that when said bottle member rests on said base member the upper edge of said base member fits snuggly between said skirt member and said bottle member thereby preventing any tilting movement of said bottle member;
b. rivet means mounted on said rounded bottom, downwardly extending; and
c. a hole in said base member cooperatively positioned so as to receive said rivet means, thereby maintaining said bottle member attached to said base member.

4,573,605

REPLACEABLE CLOSURE ARRANGEMENT

Theodore H. Udell, West Chester, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed May 6, 1985, Ser. No. 730,724
Int. Cl.[4] B65D *53/00*
U.S. Cl. 220—304 9 Claims



1. A closure arrangement for a container, such as a molded plastic drum, comprising, in combination:
(a) a container having projecting therefrom an integral, cylindrical neck with internal threads for receiving a closure member with external threads;
(b) a closure plug, including:
(i) a cylindrical skirt with external threads;
(ii) an annular flange extending radially outward from an upper portion of said skirt;
(c) a replaceable closure device including:
(i) a cylindrical skirt with external and internal threads for engagement with the threads of said container neck and said closure plug, respectively;
(ii) an annular upper flange extending radially outward from an upper portion of said skirt and being adapted for engagement with the flange of said closure plug;
(d) means for preventing further relative portion between said replaceable closure device and said container neck after the former has been threadably received within the latter.

4,573,606

AUTOMATIC PILL DISPENSER AND METHOD OF ADMINISTERING MEDICAL PILLS

Kermit E. Lewis, R.R. 5, Box 64, Shelbyville, Ind. 46176, and Arthur S. Roberts, Jr., Shelbyville, Ind., assignors to Kermit E. Lewis, Shelbyville, Ind., a part interest

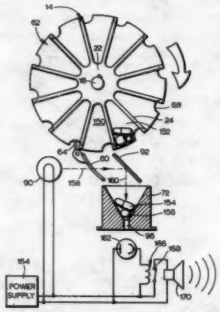
Filed Sep. 12, 1983, Ser. No. 530,893
Int. Cl.[4] B65H *29/26*
U.S. Cl. 221—2 9 Claims

1. An automatic pill dispenser for dispensing medical pills, such as tablets, capsules or suppositories, having different prescribed administration schedules, comprising:
(a) a plurality of pill storage compartments for holding pills having different administration schedules, said compartments each being sized to hold one or more pills;
(b) means for releasing pills from said pill storage compartments at predetermined time intervals corresponding with their respective administration schedules;

(c) a pill receptacle for receiving pills released from said storage compartments; and

(d) means for detecting the delivery of a pill into said receptacle and for producing a sensible signal in response thereto,

in which said detecting means comprises a photoelectric detector having a light source and photodetector arranged such that delivery of a pill of any commercial size from said storage compartments into said receptacle causes interruption of a



light beam generated by said light source, said receptacle is provided with a vertical through-hole of diameter less than one-eighth of an inch, said receptacle includes means for positioning a first pill received from said storage compartments over said hole, and in which said light source and photodetector are arranged such that said light source generates a light beam which normally passes through said hole whereby a first pill received from said storage compartments interrupts the light beam passing through said hole.

4,573,607

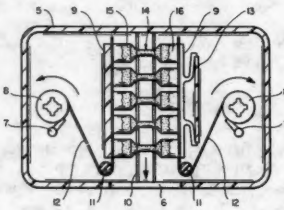
TUBE STORAGE AND DELIVERY DEVICE

John P. Arrington, San Mateo; Kathleen A. Jaraczewski, Mountain View; Marc F. Moisson, Los Altos, and Martin L. Wisecarver, Sonora, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Filed Oct. 7, 1983, Ser. No. 539,848

Int. Cl.[4] B65D *83/00*

U.S. Cl. 221—25 **6 Claims**



1. An article for storing and dispensing optical fiber splicing tubes containing adhesive for splicing optical fibers, comprising:

a casing;

a plurality of tubes having first and second open ends and containing an adhesive for splicing optical fibers;

first and second flexible tapes;

means for continuously pressing the first and second flexible tapes against the first and second open ends of the tubes to continuously sealingly engage the first and second ends of the tubes within the casing; and

means for moving the first and second tapes relative to the casing to dispense individual ones of the tubes.

4,573,608

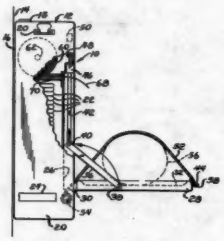
BABY CHANGING APPARATUS

Nancy Hansen, Box 57, Hadar, Nebr. 68738

Continuation of Ser. No. 445,022, Nov. 29, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,158

Int. Cl.[4] B65G *59/06*

U.S. Cl. 221—92 **4 Claims**



1. Baby changing apparatus comprising a housing having therein packages of disposable diapers and having coin control means for dispensing such packages from said housing, a table hingedly supported from said housing for pivotal movement between vertical storage and horizontal operating positions, means for supporting said table in horizontal operating position, said table having a recessed surface which faces upwardly with said table in horizontal position and on which a baby may be disposed for diaper changing, latch means for holding said table in vertical position, and electrically operable latch release means therefor for permitting said table to move to horizontal position.

4,573,609

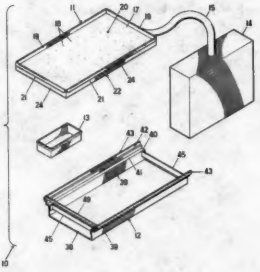
SEED PLANTING APPARATUS

Sylvester M. Tesch, Jr., Rte. 1, Highway 12 and PF, Prairie du Sac, Wis. 53578, assignor to Sylvester H. Tesch, Jr.; Marlynn F. Tesch, both of Prairie Du Sac; Harvey J. Rasmussen; Patricia Rasmussen and Harvey E. Rasmussen, all of Lodi, all of, Wis.

Filed May 11, 1984, Ser. No. 609,271

Int. Cl.[4] B65G *59/04*

U.S. Cl. 221—211 **19 Claims**



1. Seed planting apparatus for aiding an operator in depositing seeds in selected spacing in a planting tray, comprising:

(a) a seed distribution tray having a flat top plate with an array of perforations formed therein at the desired spacing of the seeds to be planted, upright side walls extending upwardly from and surrounding the top plate, a bottom

wall and side walls defining with the top plate a vacuum chamber, and a fitting on the distribution tray having a bore in communication with the vacuum chamber and adapted for connection to a source of vacuum to thereby place the vacuum chamber under vacuum draw; and

(b) a holding pan having a bottom wall and upright enclosure walls adapted to locate the planting tray laterally and support means on the enclosure walls for supporting the seed distribution tray in inverted position above a planting tray located between the enclosure walls and accurately locating the inverted seed distribution tray with respect to the planting tray so held.

4,573,610

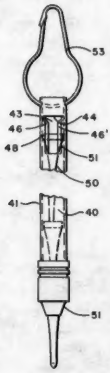
GOLF TEE DISPENSER

Erwin E. Hurner, 2605 S. Rivershore Dr., Moorhead, Minn. 56560

Filed Jun. 28, 1984, Ser. No. 625,661

Int. Cl.⁴ B65G *59/06*

U.S. Cl. 221—281 **2 Claims**



1. A container and dispenser for golf tees comprising:

a tube having a cylindrical opening through the center thereof, said cylindrical opening having a diameter larger than the diameter of the head of a golf tee and less than the length of a golf tee;

an elastomeric nipple attached to one end of said tube, said nipple defining an orifice smaller than the head of a golf tee and larger than the pointed end of a tee, said orifice communicating with said cylindrical opening; said tube defining an opening for loading of golf tees into said cylindrical opening;

said opening for loading golf tees being a generally triangular opening through said tube and defined by the sidewalls thereof and having an upper surface and tapering sidewalls to define said opening, said upper surface and said tapering sidewalls of said opening defining a space therethrough which is less than the special relationship defined by the upper surface of a tee and the neck portion thereof whereby a tee is forcefully loaded through said opening.

4,573,611

NON-REFILLABLE VALVE

Robert F. O'Connor, Greenville, R.I., assignor to Amtrol Inc., West Warwick, R.I.

Filed Jun. 11, 1984, Ser. No. 619,503

Int. Cl.⁴ B65D *47/02*

U.S. Cl. 222—147 **11 Claims**

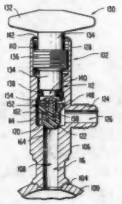
1. Non-refillable valve for a pressure container, comprising:

(a) a housing, having a central bore which has a lower portion that is narrower than the middle portion of said central bore and which has an upper portion that is narrower than middle portion of said central bore, and having a side port which communicates with the lower region of said middle portion of said central bore, the lower end of said housing being adapted to sealingly engage said pressure container in a manner which provides communication between said pressure container and said lower portion of said central bore;

(b) an outlet nozzle, having a bore lengthwise therethrough, said outlet nozzle being positioned on the side of said housing and being in communication with said middle portion of said central bore via said side port in said housing;

(c) valve stem means positioned in said upper portion of said central bore in a rotatable manner which advances the valve stem means back and/or forth in said central bore, a tube being mounted on the internal end of said valve stem means which extends into said middle portion of said central bore; and

(d) a resilient valve sealing member which has a body portion, an upper flange that extends upwardly and outwardly from



said body, a longitudinal passageway being present in the body portion, the bottom portion of the longitudinal passageway not extending through the bottom of the body portion, a vertical post being positioned in the middle of the longitudinal passageway, thereby forming a slot around the vertical post, said post slidingly engaging said tube on the bottom of said valve stem means, said flange portion of said sealing member being compressingly positioned in said upper portion of said central bore when said valve is inactive or being filled, said valve sealing member being pushed into said middle portion by means of said valve stem means when said valve is placed in the active position, said valve sealing member being seated against the interface between said middle and lower portions of said central bore when said valve is closed and said sealing member being positioned in said middle chamber above the seating interface when the valve is used for discharge of said container, and said sealing member sealingly engaging said seating interface when refill of container with pressurized fluid is attempted.

4,573,612

LIQUID SOAP DISPENSER

David Maddison, Worthing, and Christopher Dawson, Hassocks, both of England, assignors to Kimberly-Clark Limited, Kent, England

Filed Nov. 28, 1983, Ser. No. 555,536

Claims priority, application United Kingdom, Mar. 12, 1982, 8234623

Int. Cl.⁴ B65D *35/22*

U.S. Cl. 222—94 **14 Claims**

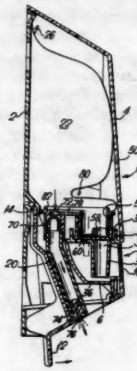
1. A refill container for a liquid dispenser, and comprising:

a dispensing tube through which said liquid is dispensed from said dispenser;

container means for furnishing a primary supply of liquid to said dispensing tube during use and to a reservoir providing an auxiliary supply of liquid for said dispensing tube; and

a fitment means for providing liquid communication between said container means and said reservoir in order to

supply said reservoir from said container means and for providing for said auxillary supply of liquid to said dispensing tube upon substantial depletion of said primary supply.



4,573,613

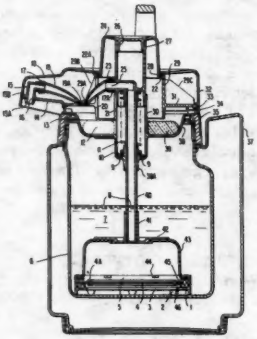
SEALING AND TOP-DRAINAGE IMPROVEMENT IN MECHANICAL DEVICE TO TRANSFER LIQUIDS FROM CONTAINERS

Elias M. de Freitas, Porto Alegre, Brazil, assignor to Termolar S/A, Porto Alegre, Brazil

Continuation-in-part of Ser. No. 342,970, Jan. 26, 1982, Pat. No. 4,506,812, and a continuation-in-part of Ser. No. 342,987, Jan. 26, 1982, Pat. No. 4,440,328, and a continuation-in-part of Ser. No. 339,547, Jan. 15, 1982, Pat. No. 4,429,813. This application Feb. 6, 1984, Ser. No. 577,475

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—213 **2 Claims**



1. A mechanical device to transfer liquids from containers which, when fitted into a container, does not require its inclination, and does not depend on its air tightness and volume, comprising a pump including a flexible bell shaped member (43), with an upper orifice, and a widened ring-like area in its lower extremity, forming a housing (45) where a rigid veined disc is located forming a disc-valve (4), said housing being provided, in its upper internal edge, with small prominences (44) and the lower edge, which limits the opening of the mouth of the bell shaped member, and ends in a small inner vertical projection forming a continuous rim (46); a liquids transference pipe (40) connected to the upper orifice of the bell shaped member, and when a vertical manual compression effort is made, the bell shaped member is deformed, compressing the liquid inside it, thereby pressing the disc-valve (4) against the continuous rim (46) of the housing (45), thereby sealing of the mouth of the bell shaped member and forcing the liquid to flow out through the transference pipe (40); the prominences (44) of the housing limiting the upward movement of the disc-valve, leaving an empty space for the inflow of the liquid in the bell shaped member (43) when it returns to its original shape, the liquids transference pipe being further connected at its upper end to conveying means which in turn are connected to spout means, said conveying means including a flexible tubing, said mechanical device further having a rotatable cover with an interior space thereof for accommodating said flexible tubing and being provided with squeezing means for closing said flexible tubing, the squeezing of the flexible tubing obtained by vertical displacement of tubing.

4,573,614

TONER VESSEL FOR COPYING MACHINE

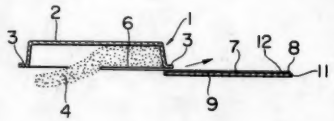
Seiji Ozawa, Numazu, Japan, assignor to Ricoh, Ltd, Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 527,132

Claims priority, application Japan, Sep. 6, 1982, 57-134963[U]

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—542 **3 Claims**



1. A toner vessel for use in a copying machine indluding a square dish-shaped vessel body which has an opening at its upper part and is provided with an outwardly projecting flange at the peripheral edge portion of said opening, said vessel body receiving a toner therein, a cover sheet which is folded on itself so as to have an upper part and a lower part, said opening being covered with said lower part of said folded cover sheet, said upper part being superposed on said lower part and having a fore end portion extending beyond of the flange on said vessel body, a cover plate secured slidably to the upper part of the vessel body and having a back surface facing toward said cover sheet and vessel body, the fore end portion of said cover sheet upper part being adhered to the fore end of the back surface of said cover plate.

4,573,615

FASTENING DEVICE FOR POURER PLUGS

Juan P. Marti, No. 89 Avde de Roma, Manlleu (Barcelona), Spain

Filed Jan. 10, 1984, Ser. No. 569,580

Claims priority, application Spain, Jan. 11, 1983, 269664[U]

Int. Cl.[4] B65D *5/72*

U.S. Cl. 222—566 **4 Claims**

1. A pourer plug assembly for a container defining therein a product reservoir, said assembly comprising:

a cover for said container, said cover having means associated with the outer edge thereof for attaching the cover to the container, said cover defining a central opening therethrough;

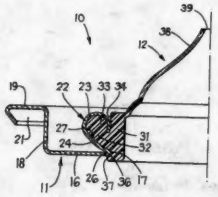
said cover having a fastening flange fixed thereto in surrounding relationship to said central opening, said fastening flange defining therein an annular groove which opens radially inwardly for communication with said central opening;

said annular groove defined by said fastening flange having a substantially L-shaped cross section and including a first leg which projects radially outwardly from and communi-

cates with the central opening, and a second leg which projects upwardly from the outer end of said first leg;

a pourer plug of a flexible material positioned within said central opening and securely connected to said cover;

said pourer plug having a base ring positioned within said central opening, and a fastening rim integrally fixed to said base ring and projecting radially outward therefrom into said annular groove, said fastening rim having a substantially L-shaped cross section compatible with said groove and including a bottom leg which projects outwardly from the base ring and terminates in an upwardly projecting leg which is spaced radially outwardly from said base ring by means of a ring-shaped slot therebetween which



opens upwardly, said upwardly projecting leg having a rounded outer profile;

said fastening flange having a substantially semi-circular ring part thereon which partially and snugly encircles the upwardly projecting leg of said rim and projects downwardly into said ring-shaped slot for securely connecting said cover and plug together, said semi-circular ring part opening downwardly and defining therein the second leg of said groove, said ring part having a radially inner portion which defines the free edge of the cover and which projects into said ring-shaped slot; and

said plug having a tubular pouring spout integrally connected to said base ring.

4,573,616

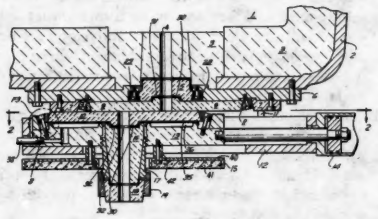
VALVE, CLAMP, REFRACTORY AND METHOD

Earl P. Shapland, Sarasota, Fla., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Continuation-in-part of Ser. No. 381,063, May 24, 1982. This application Jun. 19, 1984, Ser. No. 622,235

Int. Cl.[4] B22D *37/00, 41/08*

U.S. Cl. 222—600 **23 Claims**



1. A refractory plate for use with a sliding gate valve comprising

a refractory slab having opposite faces,

one face being a sliding face and one face being a mounting face,

said slab having edge portions between the opposite faces,

at least two opposed edge portions being tapered,

said slab width and length enlarging progressively from the sliding face towards the mounting face along substantially the entire extent of the tapered edge portions,

said taper permitting central and mounting compressive forces on the edges when engaged by a clamp having a mating tapered face.

4,573,617

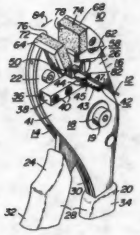
TOOL MEANS FOR SEVERING AN OPTICAL FIBER

Carl J. Durkow, Runnemede, N.J., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 14, 1983, Ser. No. 560,897

Int. Cl.[4] C03B *37/16*

U.S. Cl. 225—96 **27 Claims**



1. Tool means for severing an optical glass fiber comprising first and second members joined by pivotal connecting means for pivotal movement relative to one another, each member having first and second end portions on opposite sides of the connecting means, the first end portions providing opposing jaws and the second end portions providing handle means for moving said jaws toward and away from one another, a resilient element carried by one jaw having a surface for supporting thereon an optical fiber to be severed, blade means secured to the other jaw having a cutting edge spaced from the resilient element when the jaws are separated, said jaws being relatively movable toward one another by said handle means to move said blade means toward the surface of the resilient element for engaging and inflicting a flaw on the surface of an optical fiber supported by the resilient element, and resilient pad units secured to said jaws for receiving therebetween and applying compressive force to a fiber having an inflicted flaw on its surface.

4,573,618

APPARATUS FOR UNROLLING AND SPREADING ROLLED CLOTH

Hidetomo Kikuchi, Nishinomiya, Japan, assignor to N.C.A. Co., Ltd., Oosaka, Japan

Filed Jul. 18, 1984, Ser. No. 631,904

Int. Cl.[4] B65H *23/22*

U.S. Cl. 226—42 **8 Claims**

1. An apparatus for unrolling and spreading a long roll of cloth, said apparatus comprising:

a work table, which is oblong and is positioned horizontally;

a spreader, which has wheels for running on said work table and is positioned such that it runs in the lengthwise direction of said work table;

a support table having surfaces for rotatably supporting the long roll of cloth, said support table being positioned on said spreader and being adjustable in a direction transverse to the running direction of said spreader;

a dispensing roller rotatably supported on said support table for sequentially dispensing the long roll of cloth, which is supported by said support table;

a main belt conveyor, which feeds the long roll of cloth dispensed by said dispensing roller in the running direction of said spreader;

a delivery roller rotatably supported on said spreader for

sequentially delivering the long roll of cloth fed by said main belt conveyor onto said work table;

a running servo motor for driving the wheels of said spreader;

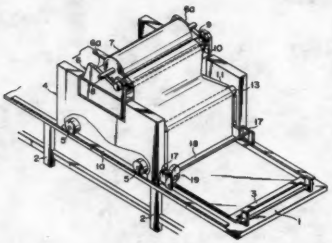
a dispensing servo motor for driving said dispensing roller;

a feed servo motor for driving said main belt conveyor;

a delivery servo motor for driving said delivery roller;

first sensing means for sensing the running distance of said spreader;

second and third sensing means for sensing the rotation speeds of said dispensing servo motor and said delivery servo motor, respectively;



a control circuit for generating a first control output signal to drive and control said running servo motor according to a preset input signal and output signal from said first sensing means; and

an operation comparing circuit in which a given variable factor of multiplication is coupled with the output signal from said first sensing means, said output signal modified by the multiplication factor is individually compared with the output signals from said second and third sensing means, and said first control output is gain-controlled by each of the results of the comparisons, thereby generating second and third control signals for synchronizing said dispensing and delivery servo motors in rotation with said running servo motor.

4,573,619

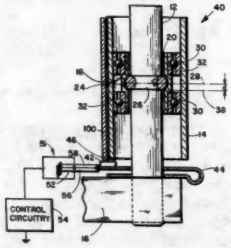
TAPE GUIDE MECHANISM FOR DYNAMIC TRACKING CONTROL

Frederic F. Grant, Bellflower, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,204

Int. Cl.[4] B65H *27/00*

U.S. Cl. 226—190 **8 Claims**



1. In a tape guide mechanism including an edge-guide element extending radially from a central axis of said tape guide mechanism, and a tape guide member, positioned axially from said edge-guide element and responsive to the wrapping of an advancing tape partially around said member, for applying an axial force to the advancing tape to move the tape laterally in the direction of said edge-guide element, to maintain a predetermined edge of the tape in continuous contact with a reference surface of said edge-guide element during tape transport movement, the improvement comprising:

(a) said edge-guide element being mounted for axial movement relative to said tape guide member; and

(b) energizable means having an output, coupled to said edge-guide element and arranged for movement in response to a voltage signal that is functionally related to a tape tracking error, for causing axial movement of said edge-guide element relative to said tape guide member in accordance with the movement of the output of said energizable means, whereby the tape is caused to move laterally in accordance with the movement of said edge-guide element.

4,573,620

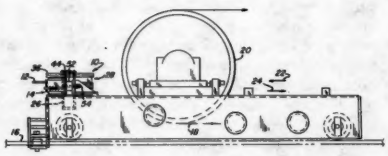
APPARATUS FOR ABSORBING A FORCE APPLIED TO A CABLE OR THE LIKE

Michael M. Sinar, Valparaiso, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 4, 1984, Ser. No. 657,654

Int. Cl.[4] B65H *20/00*

U.S. Cl. 226—190 **6 Claims**



1. Apparatus for absorbing a jerking load applied to a cable used to displace an object in one direction comprising:

a. a spindle affixed at one end thereof to said object;

b. a drum around which said cable may be wrapped, said drum being disposed around said spindle so as to be coaxial with said spindle and rotatable about the axis of said spindle;

c. an arm affixed at a first end thereof to said drum, said arm extending radially from said drum and perpendicular to the axis of said drum, said arm having a face area on the other end of said arm perpendicular to the direction of movement of said arm when said drum is rotated about said spindle, said face area being disposed on the leading side of said arm when said arm is moved by the action of said load on said cable and said cable on said drum respectively, said arm also having a means for retaining said cable;

d. a bracket means affixed to said object and having a surface disposed parallel to and opposite to said face area;

e. a first resilient member disposed between said face area and said surface, said resilient member being affixed to either said face area or said surface or to both said face area and to said surface;

f. a second resilient member coaxial with said first resilient member, said second resilient member being affixed to the opposite side of said surface from said first resilient member;

g. means for operatively connecting said first resilient member and said second resilient member; and

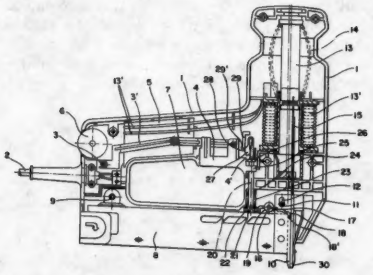
h. a cover plate affixed to the end of said drum furthest from said object and configured so as to retain said drum on said spindle.

4,573,621

ELECTRO-MAGNETIC TACKER

Manfred Merkator, and Karl Schmid, both of Idstein, Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Apr. 22, 1985, Ser. No. 725,393
Int. Cl.[4] B25C 5/06, 5/15; B27F 7/26, 7/38
U.S. Cl. 227—8 15 Claims



1. An electro-magnetic tacker, comprising:

a staple magazine mounted on a housing of the tacker and having a staple output end provided with a staple output channel;

said staple magazine being movable between a blocking position, in which said staple output end is pivoted downwardly in relation to said tacker housing, and an operating position in which said output end is pivoted upwardly into a position adjacent said tacker housing;

a coupling element located between said staple magazine and an actuator element of a main operating switch;

said coupling element being connected to said tacker magazine and being provided with an engagement portion, said engagement portion being engaged by said actuator element in an actuated position thereof to hold said staple magazine in said operating position; and

staple blocking means for blocking feeding of a front staple in said staple output end of said staple magazine in said operating position of said staple magazine, and for permitting feeding of such front staple into said staple output channel in said blocking position of said staple magazine.

4,573,622

SURGICAL FASTENER APPLYING APPARATUS WITH VARIABLE FASTENER ARRAYS

David T. Green, Norwalk, and Edgar D. Gunning, Danbury, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

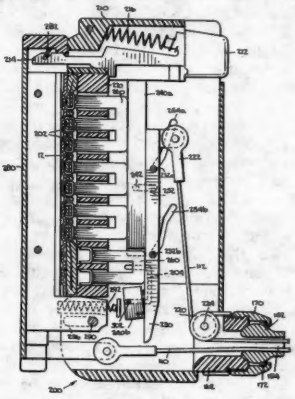
Filed Oct. 19, 1984, Ser. No. 662,678
Int. Cl.[4] A61B 17/04; B25C 5/00
U.S. Cl. 227—19 5 Claims

1. Apparatus for applying an array of surgical fasteners to body tissue comprising:

a plurality of surgical fasteners in a predetermined array, said array being subdivided into first and second subarrays;

first and second pusher means for respectively pushing the fasteners in the first and second subarrays into the tissue;

first means for supplying the work required for pushing the fasteners into the tissue; and



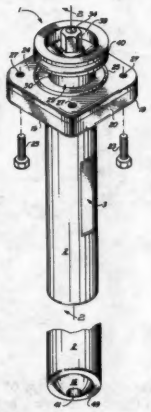
second means for optionally transmitting the work supplied by the first means to either the first and second pusher means together or to the first pusher means only.

4,573,623

DIMPLER APPARATUS FOR NAIL GUNS

Joseph A. Sexton, Jr., 6398 Bocage Cir., Shreveport, La. 71119, and Eric J. Vanwinkle, P.O. Box 28, Bethany, La. 71007

Filed Dec. 3, 1984, Ser. No. 677,398
Int. Cl.[4] B25C 1/04
U.S. Cl. 227—66 28 Claims



1. A dimpler apparatus for driving nails and providing dimples in a drywall panel comprising:

(a) a housing;

(b) bias means provided in one end of said housing;

(c) guide means carried by the opposite end of said housing; a bore extending transversly into said guide means; and a stop opening extending said bore through said guide means and having a cross-section shaped in the configuration of a first polygon;

(d) dimpler means slidably disposed in said housing and said bore in said guide means, with one end of said dimpler

means in contact with said bias means and the opposite end of said dimpler means shaped in the configuration of said first polygon and slidably disposed in said stop opening; stop means in association with said opposite end of said dimpler means, said stop means contacting said guide means when said bias means is not tensioned by said dimpler means; and a dimpler opening extending through said dimpler means;

(e) a traveling stop carried by said opposite end of said dimpler means, said traveling stop normally spaced from said guide means when said bias means is not tensioned by said dimpler means, and a traveling stop opening in said traveling stop, said traveling stop opening communicating with said dimpler opening;

(f) nail access means provided in said housing and said dimpler means, said nail access means communicating with said dimpler opening; and

(g) a driver shaft slidably disposed in said traveling stop opening and said dimpler opening, with one end of said driver shaft adapted to drive nails, and stop means provided on said driver shaft for limiting the travel of said driver shaft, whereby reciprocation of said driver shaft in a first increment of travel effects contact between said one end of said driver shaft and nails sequentially fed into said dimpler opening to drive the nails into the drywall panel, and displacement of said dimpler means against the bias of said bias means in concert with said driver shaft in a second increment of travel creates dimples in the panels.

4,573,624

PORTABLE ELECTRIC STAPLER

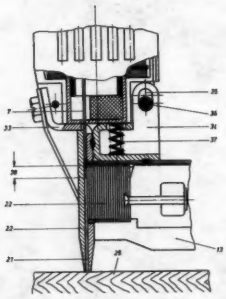
Erwin Müller; Czeslaw Zakrzewski, and Burghard Matzdorf, all of Lingen, Fed. Rep. of Germany, assignors to Erwin Müller GmbH & Co., Lingen, Fed. Rep. of Germany

Division of Ser. No. 527,314, Aug. 29, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,667

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232137

Int. Cl.⁴ B25C 5/15

U.S. Cl. 227—121 **18 Claims**



1. Apparatus for driving nails, staples or analogous fasteners into workpieces, comprising a housing defining a path along which successive individual fasteners can be advanced in a predetermined direction to penetrate into a selected workpiece; a magazine arranged to store a series of coherent but separable fasteners and having outlet means communicating with said path; means for urging successive fasteners of the series through said outlet means and into said path; a reciprocable impeller disposed in said path and normally assuming a predetermined starting position behind said outlet means, as considered in said direction; propelling means actuatable to propel the impeller in said direction with reference to said outlet means so that a fastener in said path is advanced toward a workpiece which is disposed in front of the path in response to each actuation of the propelling means, the outlet means of said magazine being movable with reference to said impeller; means for opposing movement of said outlet means from a first position in which the foremost fastener of the series is free to enter said path in the starting position of said impeller to a second position and to thereby move the fastener in said path against the impeller while the impeller assumes its starting position so that the impeller effects separation of the fastener in said path from the neighboring fastener of the series; and means for moving the impeller counter to said direction and back to said starting position through distances such that the impeller blocks the outlet means and thus prevents a fresh fastener from advancing from the magazine into said path prior to expulsion of the preceding fastener from said path.

4,573,625

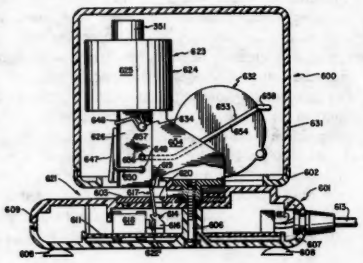
STAPLE FORMING AND DRIVING MACHINE

Paul Olesen, Bellmore; Albert Lensky, Fresh Meadows, and Richard J. Pendzich, Brooklyn, all of N.Y., assignors to Swingline Inc., Long Island City, N.Y.

Division of Ser. No. 432,553, Oct. 4, 1982. This application Oct. 16, 1984, Ser. No. 661,520

Int. Cl.⁴ B25C 5/15

U.S. Cl. 227—131 **4 Claims**



1. A staple forming and driving tool for forming staple wires fed from a staple belt into staples and driving such staples into a workpiece comprising:

(a) a lower housing unit having power supplied thereto;

(b) an upper housing unit having a block base unit, a vertical front sheath, a belt cartridge, a forming and driving unit and a solenoid for driving the forming and driving unit therein;

(c) electrical connector means for connecting the solenoid to the power source;

(d) insulating means insulating the solenoid and the electrical connector means;

(e) a front sheath mounted on the block base unit;

(f) forming and driving means being configured and the block base unit being configured to form a passageway between the front sheath and the block base to permit reciprocating movement of the forming and driving means between the block and sheath;

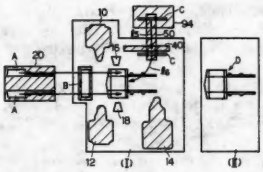
(g) the block base unit having an opening therein for receiving a staple belt; and

(h) the cartridge means having a chute portion insertable into said block base opening to restrict the size of the opening and to provide limit means for limiting upper movement of the belt during operation.

4,573,626
APPARATUS FOR ASSEMBLING FRONT UNDER PORTION OF VEHICLE BODY

Yosuke Nishiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 5, 1983, Ser. No. 539,171
Int. Cl.[4] B23K *9/12, 37/04*
U.S. Cl. 228—6.1 9 Claims



1. A system for automatically assembling components of a vehicle body, comprising:

a first overhead conveyor including a guide frame and a hanger, said first overhead conveyor extending over a first work station and a first end of a main transfer machine, said hanger extending from and being movable along said guide frame, said main transfer machine adapted to transfer said components in substantially the same direction as the direction of movement of said hanger;

a first swing-type transfer machine including a base member, a first holding plate and a horizontal shaft, said base member of said first swing-type transfer machine being positioned on the ground between said first work station and said first end of said main transfer machine, said horizontal shaft being perpendicular to the direction of movement of the hanger along the guide frame of said first overhead conveyor, said first holding plate being pivotally mounted on the horizontal shaft, first swing-type transfer machine being located under said first overhead conveyor and being adapted to remain under said first overhead conveyor for substantially an entire swing of said swingably mounted plate;

automatic welding equipment;

a second swing-type transfer machine having a vertical shaft and a second holding plate, said second holding plate being pivotally mounted on the vertical shaft;

a second overhead conveyor including a guide frame and a hanger, the guide frame of said second overhead conveyor being perpendicular to the guide frame of said first overhead conveyor, the second overhead conveyor extending over a second work station to said second swing-type transfer machine, the hanger of said second overhead conveyor extending from and being movable along the guide frame of said second overhead conveyor;

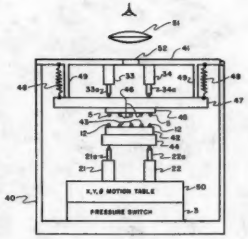
said second holding plate adapted to be swingable between a first position at which it is perpendicular to, and at one end of, said second overhead conveyor and a second swing position at which it is perpendicular to and at a second end of said main transfer machine;

said first overhead conveyor, said first swing-type transfer machine, and said second swing-type transfer machine adapted to assemble components on the main transfer machine and said automatic welding equipment being adapted to weld said components on said main transfer machine.

4,573,627
INDIUM BUMP HYBRID BONDING METHOD AND SYSTEM

Brian S. Miller, Stafford, and Aubrey J. Dunn, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,223
Int. Cl.[4] B23K *20/00, 31/02*
U.S. Cl. 228—102 2 Claims



1. A method of bonding together two arrays of indium bumps on two circuit boards, wherein corresponding additional indium bumps are formed on each board, outside of said arrays, and wherein means is provided to translate said boards toward each other, said means including an energizible actuator corresponding to each of said additional bumps, the method including the steps of:

placing said boards on said means in approximate parallel conjunction;

aligning said boards such that corresponding bumps of said arrays of bumps and said additional bumps are juxtaposed;

energizing said actuators of said means to cause translation of said boards toward each other;

stopping translation of corresponding actuators as corresponding ones of said additional bumps on said two boards come in contact with each other, until all said actuators are stopped;

reenergizing at least those actuators associated with the additional bumps on one of said boards until a predetermined pressure is reached between said boards;

deenergizing and retracting all actuators when said pressure is reached, and;

removing the boards thus bonded from said means.

4,573,628
METHOD FOR TAPPING INTO TUBING UNDER A CONTROLLED ATMOSPHERE, IN PARTICULAR FOR TUBING IN A NUCLEAR POWER STATION

Gérard Dohlen, Ecuelle; Jean-Claude Le Marquis, Moret, and Claude Oberlin, Avon, all of France, assignors to Electricite de France, Paris, France

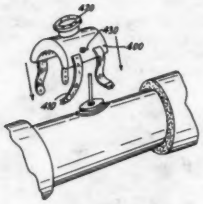
Filed Mar. 20, 1984, Ser. No. 591,405
Claims priority, application France, Mar. 24, 1983, 83 04838
Int. Cl.[4] F16K *43/00*
U.S. Cl. 228—170 5 Claims

1. A method of making a tapping point into tubing under a controlled atmosphere, in particular into tubing in a nuclear power station, wherein the method comprises the steps of:

digging out a continuous groove in the wall of the tubing at the location of the tapping point to be made, said groove being slightly shallower than the thickness of the wall, thereby leaving a membrane of metal at the bottom of the groove between the inside of the tubing and the outside atmosphere;

placing a sealed isolation unit on the tubing, said unit covering a wide area which is at least equal to the area delimited by the groove;

breaking the metal membrane so as to make an opening in the wall of the tubing;
removing the cut out portion of the wall;



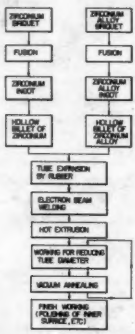
welding on a blind tail-pipe; and
removing the sealed isolation unit.

4,573,629

METHOD OF PRODUCTION OF CLADDING TUBE FOR NUCLEAR FUEL ELEMENT

Hiromichi Imahashi, Hitachi; Akira Kawahara, Ibaraki; Takao Konishi; Yoshihumi Morimoto, both of Nishinomiya; Michio Terui, Tokyo, and Yoshio Yagi, Toda, all of Japan, assignors to Hitachi, Ltd., Tokyo; Sumitomo Metal Industries, Ltd., Osaka and Nippon Mining Co., Ltd., Tokyo, all of, Japan

Filed Aug. 10, 1981, Ser. No. 291,330
Claims priority, application Japan, Aug. 15, 1980, 55-111630
Int. Cl.[4] B21D *39/00*
U.S. Cl. 228—173.2 **15 Claims**



1. A method of producing a composite type cladding tube for a nuclear fuel element, comprising the steps of:
preparing a hollow outer billet of a nuclear fuel cladding material and a hollow inner billet having an outer diameter smaller than the inner diameter of the hollow outer billet;
inserting the hollow inner billet into the hollow outer billet;
inserting into the hollow inner billet a resilient member longer than the inner billet in length and disposed so that the end portions of said resilient member protrude axially outwardly from both ends of the inner billet;
inserting said outer and inner billets and said resilient member into a die;
applying pressure to the resilient member in the axial direction of the billets to force the inner billet against the outer billet to form a pressure bonding between an inner surface of the outer billet and an outer surface of the inner billet while preventing the resilient member from leaking that might otherwise be caused by a change in the axial length of the inner billet;
joining and hermetically sealing in a vacuum all of the interface portions existing at both ends of the pressure-bonded hollow billet;
working the integrally bonded hollow billet into a composite tube of a small diameter and thin thickness; and
polishing the inner surface of the composite tube by use of both mechanical polishing and chemical polishing, thereby controlling the thickness of the inner tube portion to a desired level while controlling the whole of the composite tube to a uniform thickness.

4,573,630

HOMOGENEOUS LOW MELTING POINT COPPER BASED ALLOYS

Debasis Bose, Randolph; Amitava Datta, Morris Township, Morris County, and Nicholas J. DeCristofaro, Chatham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 488,851, Apr. 26, 1983, Pat. No. 4,489,136, which is a continuation-in-part of Ser. No. 420,549, Sep. 20, 1982, Pat. No. 4,460,658. This application Aug. 27, 1984, Ser. No. 644,290
The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.[4] B23K *35/30*
U.S. Cl. 228—263.18 **5 Claims**

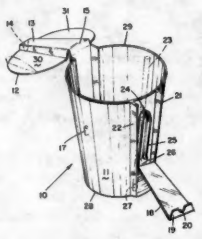
1. A process for joining together two or more metal parts which comprises:
(a) interposing a filler metal between the metal parts to form an assembly, the filler metal having a melting point less than that of any of the parts;
(b) heating the assembly to at least the melting temperature of the filler metal; and
(c) cooling the assembly; wherein the improvement comprises employing, as the filler metal, a homogeneous copper based foil having a composition consisting essentially of 5 to 52 atom percent nickel, 2 to 10 atom percent tin and 10 to 15 atom percent phosphorus, the balance being copper and incidental impurities and the total of copper, nickel and tin ranging from about 85 to 90 atom percent.

4,573,631

DISPOSABLE STRAW, LID AND CUP COMBINATION

Michael Reeves, 2299 Fountain Way East, #D, Costa Mesa, Calif. 92627

Filed Jun. 22, 1984, Ser. No. 623,703
Int. Cl.[4] B65D *1/00, 25/38*
U.S. Cl. 229—7 S **7 Claims**



1. An improved cup, lid and straw combination, comprising:
(a) a cup having a generally tapered sidewall with a closed bottom and an open top portion, one portion of said sidewall having an outwardly-radiating trough extending from the top to the bottom of said cup, and an outwardly radiating sanitary enclosure extending from the top of the cup to the bottom, said enclosure having a cover hinged intermediate the enclosure, the exterior shape of said enclosure being substantially the same shape as the cup's

trough, with an aperture in the bottom of the sidewall of the cup opening into the sanitary enclosure;

(b) a lid, said lid including a trough section therein, one end of said trough having a manual pull-tab thereon, the opposite end of said trough having a hinge thereon, said hinge being operably secured to the top of said trough in said sidewall of said cup; and

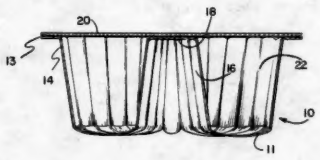
(c) a straw having a flexible portion therein, one end of said straw being mounted in said sidewall through the aperture therein, and the balance of said straw being operably arranged for containment within said sanitary enclosure.

4,573,632

FOOD CONTAINER

Jan-Mathieu Scheeren, Holset 38, 6295 NC Lemiers, Netherlands

Filed May 29, 1984, Ser. No. 615,047
Int. Cl.[4] B65D *1/34*
U.S. Cl. 229—2.5 R **2 Claims**



1. A food container for receiving moldable foodstuffs conforming to the shape of the container, comprising

a container body made of pliant thermoplastic PVC and having the shape of a pound-cake tin defining an open annular food-receiving channel disposed around a central region;

said container body having a bottom with an inner wall, and having an outer wall extending upwardly from the bottom to an outer edge surrounding said annular channel, said inner and outer walls tapering outwardly from the bottom so as to promote unitary release of a molded foodstuff received therein;

a rim joining said outer edge of the outer wall and extending horizontally out therefrom to surround the outer edge of the container body;

said inner wall defining a central truncated cone extending upwardly from said bottom of the container body;

said truncated cone having a closed top;

said top being horizontal and substantially coplanar with said horizontal rim surrounding the outer edge of the container body, so that the horizontal closed top of the central truncated cone is at the same level as the horizontal rim,

whereby the solidity of the container is enhanced by the horizontal rim outside the container body and by the closed horizontal top of the central truncated cone.

4,573,633

CORNER LOCK ON PAPERBOARD BAKING AND SHIPPING TRAY

James A. Brian, San Antonio, Tex., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jun. 25, 1984, Ser. No. 624,153
Int. Cl.[4] B65D *5/22*
U.S. Cl. 229—32 **2 Claims**

1. A baking and shipping tray formed from a unitary blank of paperboard material having a baking surface, said tray defining an interior and comprising:

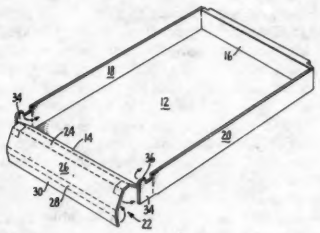
a bottom wall;

a first pair of opposed side walls connected to said bottom wall along fold lines;

a second pair of opposed side walls connected to said bottom wall along fold lines;

channel defining members connected to each of said first pair of side walls, the channel defining members each comprising a plurality of channel panels folded relative to one another to define an open-ended channel and including a first channel panel extending outwardly from one of said first pair of side walls, a second channel panel extending downwardly from said first channel panel substantially parallel to said one side wall and spaced therefrom, a third channel panel extending from said second channel panel and inwardly toward said one side panel, and a fourth channel panel extending upwardly from said third channel panel and adjacent to said one side wall; and

locking panels extending from the ends of each said second pair of side walls and positioned in said channels, said locking panels and said channel panels cooperating to



maintain said first and second pairs of side walls substantially perpendicular to said bottom wall with only the baking surface exposed to said tray interior, said locking panels each including a lock tab positioned in a channel and at least some of said channel panels including detent means engageable with said lock tab to lock said locking panels in said channels, said detent means each comprising a first detent section formed in said first channel panel and separated by a first line of cut from a remainder of said first channel panel and a second detent section formed in said second channel panel and separated by a second line of cut from a remainder of said second channel panel and connected to said first detent section along a fold line, said first detent section being connected to said one side wall by a fold line extending from said first line of cut and said second detent section being connected to both said first detent section and said second channel panel by fold lines extending from said second line of cut.

4,573,634

TAMPER-EVIDENT CARTON

Karl A. Kohler, Roselle, and Richard F. House, St. Charles, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 18, 1985, Ser. No. 724,824
Int. Cl.[4] B65D *5/08*
U.S. Cl. 229—38 **3 Claims**

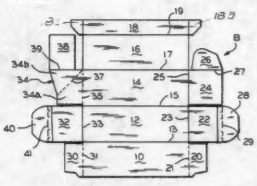


FIG. 1

1. An end loading, end opening, tubular, tamper-evident

carton formed from a unitary blank of foldable sheet material such as paperboard, comprising:

(a) a pair of opposed front and rear side wall panels and a second pair of opposed side wall panels foldably joined to each other along parallel, longitudinal fold lines to form a tubular structure open at the ends;

(b) first and second closure means for closing the opposite ends of said structure in such a manner that neither end can be opened without destroying the integrity of the carton;

(c) said first closure means including:

(i) a first inner closure foldably joined to and extending normally from a side wall panel of said second pair;

(ii) a first retaining panel foldably joined to a front edge of said first inner closure flap, extending inwardly therefrom behind said front side wall panel, and having an end portion secured to said front side wall panel;

(iii) a first intermediate closure flap foldably joined to and extending normally from the other side wall of said second pair and being disposed to overlie a portion of said first inner closure flap;

(iv) a first outer closure flap foldably joined at one edge to and extending normally from said rear side wall panel;

(v) said first outer closure flap being adhesively secured to outer surfaces of said first inner and intermediate closure flaps and having foldably joined thereto at an opposite edge thereof a tuck tab which is interposed between said front side wall panel and said first retaining panel and adhesively secured to an outer surface of the latter;

(d) said second closure means including:

(i) a second inner closure flap foldably joined to and extending normally from a side wall panel of said second pair;

(ii) a second retaining panel foldably joined to a front edge of said second inner closure flap and extending inwardly therefrom behind said front side wall panel;

(iii) a second intermediate closure flap foldably joined to and extending normally from the other side wall panel of said second pair and being disposed to overlie a portion of said second inner closure flap;

(iv) a second outer closure flap foldably joined at one edge to and extending normally from said rear side wall panel;

(v) said second outer closure flap being adhesively secured to outer surfaces of said second inner and intermediate closure flaps and having foldably joined thereto at an opposite edge thereof a tuck tab which is interposed between said front side wall panel and said second retaining panel and adhesively secured to the latter.

4,573,635

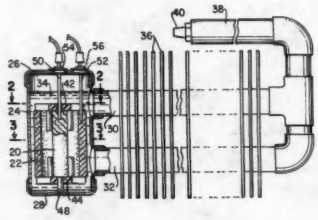
CLOSED CIRCUIT HEATING SYSTEM

Wilbur N. Lamphier, 58 Kingsberry Ave., Westwood, N.J. 07675

Filed Aug. 18, 1983, Ser. No. 524,304

Int. Cl.[4] F24H *3/00;* **H05B** *3/60*

U.S. Cl. 237—70 **1 Claim**



1. A closed circuit heating system for use as a baseboard heater or the like, comprising

a sealed tank containing an annular heating element enveloping a heating rod, insulating means for mounting said annular heating element and heating rod in a fixed spatial relationship relative to each other and the tank, said insulating means comprising upper and lower retaining members having vertically extending pins for engaging the inner surface of said annular heating element, and means enabling said heating element and heating rod to be connected to a source of electricity,

an elongated heat conducting outlet tube connected to an elongated heat conducting return tube, said tubes being connected directly to said sealed tank with said outlet tube above said return tube to form a liquid flow path in the form of a loop, said loop being airtight,

a heat conducting liquid in said tank and tubes, said heating element and heating rod being completely submerged in said liquid, and both of said tubes being filled with said liquid, and

an airtight expansion chamber connected to said loop, said closed circuit heating system being evacuated of air at least in part so that the fluids in said system are at a pressure less than atmospheric.

4,573,636

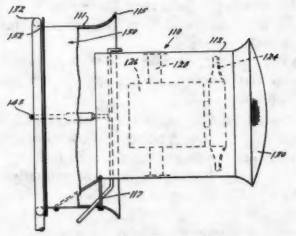
METHOD AND APPARATUS FOR MAKING ARTIFICIAL SNOW

James L. Dilworth, Petoskey, and Robert J. Brinks, Alanson, both of Mich., assignors to Nubs Nob, Inc., Harbor Springs, Mich.

Continuation-in-part of Ser. No. 473,071, Apr. 18, 1983, Pat. No. 4,493,457. This application Apr. 30, 1984, Ser. No. 605,621

Int. Cl.[4] A01G *15/00*

U.S. Cl. 239—2 S **16 Claims**



16. A method of making artificial snow including the steps of:

generating a substantially unidirectional high-volume primary airflow stream;

generating and controlling a secondary airflow stream surrounding said primary airflow stream;

injecting a high-velocity water spray across said secondary airflow stream and into said primary airflow stream from a location substantially above said primary airflow stream; and

injecting a high-velocity water spray across said secondary airflow stream and into said primary airflow stream from a location substantially below said primary airflow stream; and

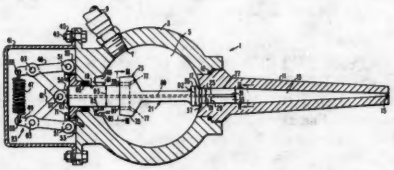
injecting into said primary airflow stream a high-velocity spray comprising a mixture of water and compressed air from a location approximately in the center of said primary airflow stream.

4,573,637

ACCELERATING SLUGS OF LIQUID

Larry L. Pater, Zelienople, and Aubrey C. Briggs, Rosslyn Farms, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1982, Ser. No. 447,000
Int. Cl.[4] B05B 1/08
U.S. Cl. 239—11 7 Claims



1. A method of accelerating a slug of liquid comprising the steps of:

introducing a volume of liquid under pressure into a closed container already filled with liquid to compress liquid within the container and thereby store energy as said pressure increases to at least 5000 psi; and

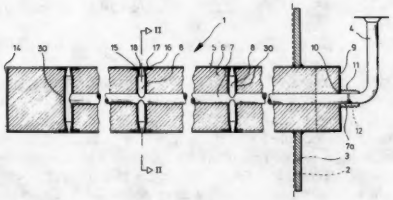
rapidly releasing a slug of liquid from said container using predominantly the energy stored in the compressed liquid to drive the slug of liquid from the container at a high velocity.

4,573,638

INJECTION PROBE

Gerd Junkers, Bad Homburg, Fed. Rep. of Germany, assignor to Wahlco, Inc., Santa Ana, Calif.

Filed Jun. 15, 1984, Ser. No. 621,205
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322464
Int. Cl.[4] B05B 1/14
U.S. Cl. 239—397.5 4 Claims



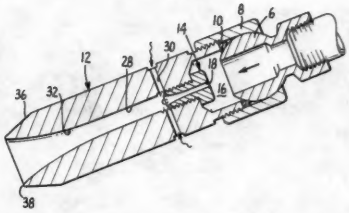
1. In an injection probe, particularly for the sulfur trioxide conditioning of flue gas of a type which includes a tubular, closed-end outer casing, a manifold connected to an elongated feed conduit provided with elongated injector tubes which, project radially outwardly from the longitudinal axis of such feed conduit through openings in the outer casing, have outer outlet openings adjacent respective openings in such casing and which injector tubes are at least partially surrounded by an insulating material, the improvement comprising: said outlet openings are reduced in cross-sectional area with respect to the inner periphery of said injector tubes axially inwardly therefrom; the outer end of each injector tube is formed with an outlet nozzle of conically convergent shape in the flow direction; and the outer periphery of each nozzle which is adjacent said openings in said casing is spaced therefrom and a refractory adhesive material is disposed therebetween.

4,573,639

SHOWER HEAD

Murl F. Logue, 29435 Sanches Rd., Newman, Calif. 95360

Continuation of Ser. No. 466,424, Feb. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 381,190, May 24, 1982, abandoned. This application Jun. 6, 1985, Ser. No. 741,816
Int. Cl.[4] E03C 1/08
U.S. Cl. 239—428.5 5 Claims



1. A shower head comprising in combination:

a. a first large chamber forming a plenum for receiving water under pressure,

b. a metering orifice providing a single fluid passage leading from said chamber,

c. said metering orifice having a cylindrical entrance section smaller in diameter than said first large chamber leading to a gently flared divergent section terminating in an outlet port having a diameter larger than said entrance section,

d. a nozzle section forming a continuation of said metering orifice, said nozzle section having a cylindrical portion extending to a divergent section forming a circular discharge port whereby water flows straight through the nozzle section with entrained air in a divergent flare,

e. the cylindrical portion of the nozzle section being slightly larger than the outlet port of the metering orifice,

f. said nozzle section having an outer surface defining said circular discharge port,

g. air entrance ports extending from the outer surface of the nozzle section at right angles to the flow of water through the nozzle section into the confluence of the outlet port of the metering orifice and the cylindrical portion of the nozzle section.

4,573,640

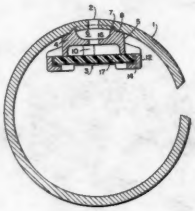
IRRIGATION EMITTER UNIT

Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel-Aviv, Israel

Continuation-in-part of Ser. No. 143,098, Apr. 23, 1980, Pat. No. 4,384,680, which is a continuation-in-part of Ser. No. 845,277, Oct. 25, 1977, Pat. No. 4,209,133, and a continuation-in-part of Ser. No. 312,910, Oct. 19, 1981, abandoned, which is a continuation of Ser. No. 164,844, Jun. 30, 1980, abandoned, which is a continuation of Ser. No. 962,688, Nov. 21, 1978, Pat. No. 4,210,287. This application Dec. 1, 1982, Ser. No. 445,998
Claims priority, application Israel, Oct. 26, 1976, 50766; Nov. 24, 1977, 53463
Int. Cl.[4] A01G 25/02
U.S. Cl. 239—542 10 Claims

1. An irrigation emitter unit comprising an elongated body member having formed in a first surface thereof an elongated groove formed with a pair of oppositely directed flow resisting baffles, said groove having an inlet end and an outlet end, there being furthermore formed in said first surface a recessed cavity of elongated shape and being of extended dimensions as compared to the width of said groove, said outlet end of said groove communicating with said cavity so that said groove extends out of said cavity and is located on one side thereof, there being formed in the base of the cavity an outlet aperture extending to a second and opposite surface of the body member and having a rim area substantially less than that of the

recessed cavity, a resiliently flexible membrane of substantially elongated shape juxtaposed with respect to said first surface so as to be pressed towards said first surface under the influence of fluid pressure so as to define with said groove, an elongated flow reducing flowpath; with said groove inlet a flowpath inlet; and with said cavity an outlet control chamber and communication means for effecting communication between an



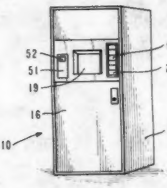
irrigation supply and said flowpath inlet and so as to allow for the exertion of said fluid pressure on said membrane; the arrangement being such that upon the fluid pressure acting on said membrane exceeding the fluid pressure in the outlet chamber by a predetermined amount, the membrane flexes elastically towards the outlet aperture so as to define, with a rim of the outlet aperture a restricted outflow path thereby limiting variations in the outflow rate.

4,573,641

GLASS BOTTLE COLLECTION AND CRUSHING APPARATUS

Bruce H. DeWoolfson, Vienna, Va.; Stanley Flowers, W. Milton, and Robert F. Freund, Centerville, both of Ohio, assignors to Environmental Products Corporation

Filed Nov. 17, 1983, Ser. No. 552,777
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—36 **4 Claims**



1. Apparatus for collecting and storing refundable empty glass bottles of two or more individual colors and for issuing predetermined return deposits for the bottles collected, each refundable bottle having a code imprinted thereon to identify the brand and color of the bottle, comprising:

(a) preselection means for determining the brand, color and refundability of a preferred empty glass bottle, the preselection means including a laser scanner for reading the imprinted code on each bottle, a bottle access area configured to accommodate the bottles for exposure to the laser scanner, and a microprocessor capable of receiving and interpreting the read code from the laser scanner;

(b) means for accepting only a bottle identified by the preselection means as being refundable, the accepting means sorting the refundable bottles into two colors, the accepting means including two panels together forming a V-shaped base portion of the bottle access area, each panel being independently tiltable inwardly toward the crushing means, and an opening means attached to each panel responsive to the preselection means to sort refundable bottles into colors by selectively tilting one of the two panels of the V-shaped base portion depending upon the color of the refundable bottle to deposit the bottle by gravity into the crushing means;

(c) means responsive to the accepting means for crushing the refundable bottles into glass cullet, the crushing means including at least one rotating crushing wheel;

(d) dispensing means responsive to the preselection means for dispensing at least one of a coin and a token in return for the refundable bottles; and

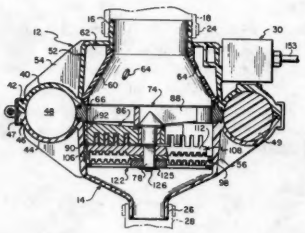
(e) means for storing the glass cullet received from the crushing means.

4,573,642

WATER POWERED WASTE DISPOSER WITH IMPROVED DYNAMIC SEAL

Leonard G. Spelber, San Diego, Calif., assignor to Wastemate Corporation, San Diego, Calif.

Filed May 7, 1984, Ser. No. 607,648
Int. Cl.[4] B02C *18/40*
U.S. Cl. 241—46 B **10 Claims**



1. A water powered waste disposer comprising:

a housing having an upper waste material receiving neck and a lower drain outlet and defining a waste cutting chamber, said housing being formed of an upper portion and a lower portion;

a plurality of stacked cutters mounted in said waste cutting chamber, certain of said cutters being rotatable, said cutters being mounted in said lower portion:

an annular toroidal chamber mounted to said housing and having an inner periphery;

a stop plug in said chamber and blocking said chamber at one position;

a piston mounted within said toroidal chamber for sliding movement around said chamber;

means to connect said piston to said rotatable cutters;

a pair of water inlets in said toroidal chamber on opposite sides of said stop plug;

valve means coupled to said inlets and having means for connection to a source of water, said valve means controlling the operation of said piston so that it reciprocates around said toroidal chamber to opposite sides of said stop plug;

a drive ring rotatably mounted between said upper and lower housing portions in the inner periphery of said toroidal chamber and being connected between said piston and said rotatable cutters, said drive ring having an outer surface opening into said toroidal chamber, said outer surface defining a portion of the inner periphery thereof;

a band of thin plastic material mounted to and covering said outer surface of said drive ring, said band extending beyond said outer surface over the immediately adjacent upper and lower portions of said inner periphery of said toroidal chamber and providing a normally moving seal between said toroidal chamber and said cutting chamber;

an annular manifold chamber mounted to said upper housing portion, said manifold chamber having circumferentially spaced spray ports directed toward said cutters; and

said valve means having exhaust outlets opening into said

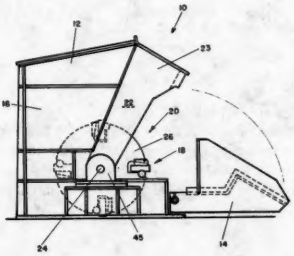
manifold chamber with means for exhausting water from said toroidal chamber into said manifold chamber.

4,573,643

IMPACT CRUSHERS

Axel W. Orphall, McMurray, and Bernd G. Albers, New Castle, both of Pa., assignors to A & O Engineering, Inc., Bridgeville, Pa.

Filed Apr. 2, 1984, Ser. No. 596,210
Int. Cl.[4] B02C *13/28*
U.S. Cl. 241—189 R **14 Claims**



1. In an impact crusher for reducing material particulates, such as limestone, grain, ore, and the like comprising:

a housing in which said material to be reduced is introduced, and

a rotor assembly in said housing having several impact assemblies consisting of breaker bar means and back-up bar means and arranged around the outer periphery of said rotor assembly for contacting and impacting said material,

said housing consisting of at least two separate portions one movable relative to the other, said movable portion being constructed and arranged to be in a closed and opened position wherein in said opened position there is provided ready access into said housing at a location where each said impact assembly is successively positionable for replacement of its respective breaker bar means such that the said breaker bar means is supported by its respective back-up bar means or said back-up means is substantially below said breaker bar means and,

extension means located outside said housing in alignment with said impact assembly which is positionable for said replacement of its respective breaker bar means, said extension means arranged to cooperate with said positioned back up bar means to provide a substantial continuous support for said positioned breaker bar means and includes means for engaging said back up bar means of said positioned assembly constructed and arranged such that said shaft is held against rotational movement, and further includes means for receiving and supporting said breaker bar means upon its removal and replacement to and from said positioned impact assembly.

4,573,644

CARPET ROLLING MACHINE

Robert W. Brown, Anoka, Minn., assignor to Production Design Products, Inc., Minneapolis, Minn.

Filed Feb. 27, 1985, Ser. No. 705,995
Int. Cl.[4] B65H *18/22*
U.S. Cl. 242—67.1 R **16 Claims**

1. A machine for rolling carpet runners which comprises:

(A) a frame,

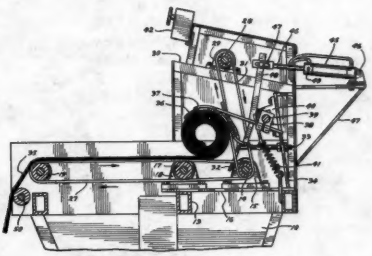
(B) a first set of at least a pair of spaced apart parallel rollers supported within said frame for rotation in a horizontal plane,

(C) drive means connected to one of said rollers,

(D) a further roller supported within said frame parallel to and spaced above the rearwardmost of said first set of rollers,

(E) a first series of a plurality of endless parallel spaced apart belts supported on said first set of rollers for longitudinal movement in response to rotation of the rollers,

(F) a second series of a plurality of endless parallel spaced apart belts supported between the rearwardmost of said first set of rollers and said further roller for generally vertical travel in response to rotation of the rollers, the belts of said second series alternating with the belts of said first series in the spaces between the belts of the first series,



(G) at least one concave forwardly facing arcuate guide plate supported at the juncture between said series of belts, the lower end of the guide plate extending into the space between the travel paths of the belts,

(H) an assembly of a plurality of concave downwardly facing fingers pivotally supported and extending forwardly in the spaces between said second series of belts and spaced above the first series of belts, and

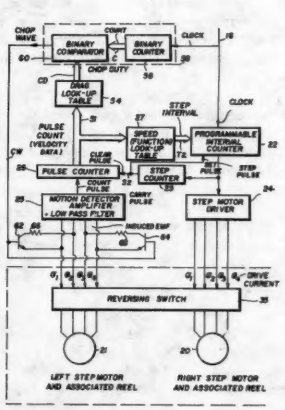
(I) means for controlling operation of said drive means.

4,573,645

RIBBON TENSION CONTROL

Samuel C. Harris, Jr., Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Nov. 23, 1983, Ser. No. 554,736
Int. Cl.[4] B65H *77/00*
U.S. Cl. 242—75.47 **27 Claims**



1. A ribbon tension controller for controlling the tension of a fixed length of ribbon as it is transferred from a rotating supply spool to a rotating take-up spool, said ribbon tension controller comprising:

alternating current generator means coupled to said supply

spool for producing braking torque to resist the rotation of said supply spool;

control means for producing a digital ribbon tension control signal related to the relative lengths of the fixed length ribbon then present on said spools; and

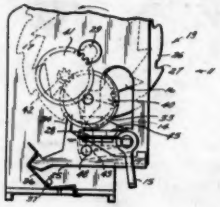
dynamic electrical braking means for dynamically varying the braking torque produced by said generator means, said braking means including switching means, electrically coupled to said generator means and to an electrical load, for selectively coupling said load to said generator means in response to said digital control signal.

4,573,646

MODE SELECTION RETRACTOR

Ronald A. Willey, Port Huron, Mich., assignor to TRW Automotive Products Inc., Cleveland, Ohio

Filed Apr. 23, 1984, Ser. No. 602,921
Int. Cl.[4] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **7 Claims**



1. A seat belt retractor for a vehicle including:

a rotatable drum on which seat belt webbing is wound,

first ratchet means secured to and rotatable with said drum,

first pawl means movable into engagement with said first ratchet means to lock said first ratchet means and thereby said drum against rotation in the direction of withdrawal of said seat belt webbing,

second ratchet means secured to and rotatable with said drum,

second pawl means movable into engagement with said second ratchet means and movable by said second ratchet means upon engagement therewith,

said second pawl means having means cooperating with said first pawl means to effect movement of said first pawl means into engagement with said first ratchet means upon movement of said second pawl means by said second ratchet means, and

means for moving said second pawl means into engagement with said second ratchet means upon withdrawal of said seat belt webbing in excess of a predetermined amount, said means for moving said second pawl means comprising lever means for moving said second pawl means into engagement with said second ratchet means and sensing means for sensing withdrawal of said seat belt webbing and for actuating said lever means upon withdrawal of said seat belt webbing in excess of said predetermined amount.

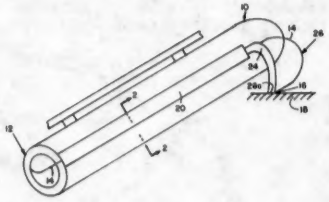
4,573,647

FIBER DEPLOYMENT MECHANISM

Bobby W. Laten, Hazel Green, and Johnny L. Prater, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,428
Int. Cl.[4] F41G *7/32*
U.S. Cl. 244—3.12 **6 Claims**

1. A fiber deployment mechanism comprising a missile having a bobbin with fiber wound thereon, a fixed support mechanism mounted relative to said missile, said fiber being connected in a fixed relationship to said fixed support mechanism, and a deployment mechanism mounted linearly of an outer surface of said missile and also connected to said fixed support mechanism and serving to mount said fiber along said outer



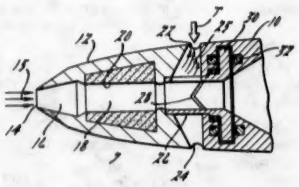
surface and for deployment by said deployment mechanism as said missile is launched away from said fixed support mechanism and preventing said fiber from having to bear undue load during launch and at the same time freeing said fiber for payout from said bobbin as said missile is launched.

4,573,648

RAM AIR COMBUSTION STEERING SYSTEM FOR A GUIDED MISSILE

Richard C. Morenus, Long Beach, and Alson C. Frazer, Santa Ana, both of Calif., assignors to Ford Aerospace and Communications Corp., Newport Beach, Calif.

PCT No. PCT/US83/00086, § 371 Date Jan. 20, 1983, § 102(e) Date Jan. 20, 1983, PCT Pub. No. WO84/02975, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 20, 1983, Ser. No. 491,953
Int. Cl.[4] F41G *7/00*
U.S. Cl. 244—3.22 **10 Claims**



1. A directional steering system for a guided missile comprising:

means defining the nose end of said missile;

means within said nose means for receiving ram air therein;

means within said nose means adjacent said ram air receiving means for providing combustible fuel;

means within said nose means defining a combustion chamber wherein ram air ignites said fuel;

means within said nose means and aft of said combustion chamber defining lateral thrust steering ports to provide escape paths for combustion gases from said combustion chambers means to the external environment;

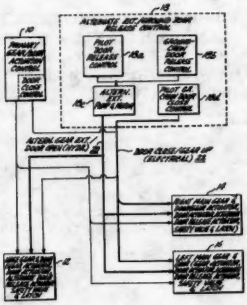
means within said nose means for selectively diverting combustion gases generated within said combustion chamber means to one or more of said lateral thrust steering ports.

4,573,649

INTEGRATED ALTERNATE GEAR EXTENSION AND GROUND-CREW DOOR OPENING/CLOSING SYSTEM FOR AN AIRCRAFT

Frank M. Yourkowski, Enumclaw, and Melvin C. Zoerb, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 1, 1983, Ser. No. 519,251
Int. Cl.[4] B64C *25/26*
U.S. Cl. 244—102 R 10 Claims



1. An integrated system for a pilot operated alternate extension control for a landing gear and associated gear door of an aircraft and a ground-crew operated door opening/closing control, comprising:

hydraulic door actuator means having a door locked closed condition and a door released condition, said hydraulic door actuator means in its released condition being unrestrained to move from a door closed position to a door open position and being adapted to receive door closing hydraulic pressure to force the gear door from its door open position to its door locked closed position;

door actuator lock means associated with said door actuator means and having locked and unlocked conditions that respectively dispose said hydraulic door actuator means in its door locked closed and door released conditions;

an alternate lock release actuator means for moving said door actuator lock means from its locked condition to its unlocked condition in order to dispose said hydraulic door actuator means in its door released condition;

safety valve means having a safe condition and an armed condition, said safety valve means normally assuring its armed condition and being interconnected with said alternate lock release actuator means so as to be disposed in said safe condition when said alternate lock release actuator moves said door actuator lock to its door released condition, said safety valve means in its safe condition blocking the receipt of said door closing hydraulic pressure by said hydraulic door actuator means;

latch means for holding said safety valve means in its safe condition when said alternate lock release actuator means moves said safety valve means from its armed condition to its safe condition;

pilot control means responsive to a pilot alternate release command to operate said alternate lock release actuator means so as to move said door actuator lock means to its unlocked condition thereby releasing said hydraulic door actuator means to release it for movement to said door open position; and

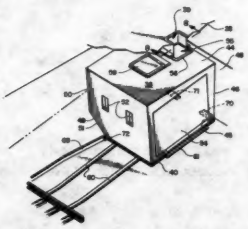
ground-crew control means responsive to a ground-crew door open command to operate said alternate lock release actuator means to move said door actuator lock means between its locked condition and its unlocked condition, and said ground-crew control means responsive to a ground-crew door close command to unlatch said latch means when holding safety valve means in its safe position to enable said safety valve means to return to its armed condition.

4,573,650

FIRE-SAFE AIRCRAFT WASTE DISPOSAL SYSTEM

James L. Clayton, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1982, Ser. No. 428,440
Int. Cl.[4] B64D *11/00, 11/04*
U.S. Cl. 244—118.5 1 Claim



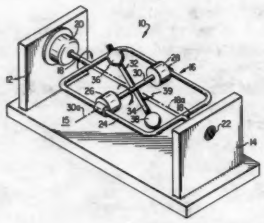
1. A fire-safe multipurpose Class D container suitable for use in receipt and stowage of waste materials inserted therein through a fire-safe waste chute formed in and extending through the deck separating the upper lobe aft galley of an aircraft from the lower lobe bulk cargo hold and adapted to be physically restrained within the bulk cargo hold during in-flight operations and wherein the bulk cargo hold is characterized by an irregular non-rectilinear shape having an upwardly and rearwardly inclined ramp-like floor and partially oblate walls converging towards the aft end of the hold, said container comprising, in combination: a standardized LD2 aircraft cargo container base compatible for use with onboard and ground located cargo handling systems, a floor mounted on said base and parallel thereto, four vertically extending walls defining two opposed pairs of walls secured to one another and to said floor in fire-safe, airtight relation, one wall in a first of said two pairs of walls being normal to said floor and the other of said walls in said first pair of walls defining an included obtuse angle with said floor with said one wall having a vertical height greater than said other wall and with said first pair of walls each having a truncated rectangular configuration adjacent its lower outboard edge, and with one wall in the second of said two pairs of walls having an inwardly and downwardly inclined lower edge adjacent the truncated portions of the walls in said first of said two pairs of walls and conformal to the configuration of the bulk cargo hold, said container being closed by a top wall which is secured to the upper edges of said four walls in airtight fire-safe relation wherein said top wall and said one wall of said first pair of walls define an included acute angle and said top wall and the other of said first pair of walls are normal to one another and wherein said container floor, top and at least one wall in each of said two opposed pairs of walls are generally conformal to and in closely spaced proximity from the ramp-like floor, ceiling and two of the walls defining said irregular non-rectilinearly shaped bulk cargo hold when positioned therein in registration with the waste chute; said top wall having an access opening formed therein for registration with the waste chute in airtight fire-safe relation; and, said container base portion including means enabling said container to be securely clamped to the floor of the bulk cargo hold in the aircraft.

4,573,651

TORQUE ORIENTATION DEVICE

Austin N. Stanton, 3017 Stonehenge La., Carrollton, Tex. 75006

Filed Dec. 19, 1983, Ser. No. 562,737
Int. Cl.[4] B64G 1/20
U.S. Cl. 244—165 13 Claims



1. A torque orientation device for attitude control of a space craft, comprising:

a frame mounted to said space craft;

a gimbal having the main axle thereof rotatably mounted to said frame and the second axle thereof normal to said main axle;

a mass assembly mounted for rotation about said second axle, said mass assembly having balanced and oppositely opposed mass elements, wherein the moment of inertia about said main axle is a function of the angular position of said mass assembly about said second axle;

means for driving said mass assembly about said second axle, and

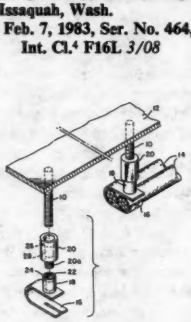
means connected to said frame for selectively applying torque about said gimbal main axle to produce a counter torque on said frame for changing the attitude of said space craft.

4,573,652

SUPPORT SYSTEM FOR MARITIME OR OTHER USE

Peter S. Richards, King County, Wash., assignor to Progressive Fastening, Inc., Issaquah, Wash.

Filed Feb. 7, 1983, Ser. No. 464,208
Int. Cl.[4] F16L 3/08
U.S. Cl. 248—74.1 2 Claims



1. A hanger assembly for supporting cabling, piping, or the like, comprising:

a stud securable at one end to a support member, the opposite end of the stud including an externally threaded portion,

an internally threaded socket securable to a clamp, and

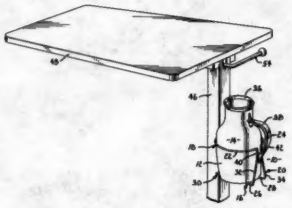
a coupling nut having (1) an internally threaded bore mating with the threads on the stud, and (2) an integral stud extension having external reverse threads mating with the internal threads of the internally threaded socket so that when the coupling nut is rotated to thread it onto the stud, the socket is simultaneously threaded onto the stud extension of the coupling nut.

4,573,653

URINAL HOLDER FOR HOSPITAL OVERBED STAND AND THE LIKE

Conrad H. Boettger, P.O. Box 329, Hesston, Kans. 67062

Filed Apr. 9, 1984, Ser. No. 598,262
Int. Cl.[4] A47G 23/02
U.S. Cl. 248—153 4 Claims



1. In combination with an upright support having at least one transversely extending mounting hole therein and an abutment surface located below said hole, a detachable holder for urinal jugs and the like comprising:

an open framework, wire rack including a jug-supporting base, a jug-retaining top spaced above the base, and a jug-retaining front integral with and interconnecting the base and the top;

a mount spaced rearwardly of the front attaching the top to said upright; and

an abutment on the base spaced below the mount and spaced rearwardly of the front in engagement with said surface,

the top having a pair of opposed, spaced apart, horizontally coplanar, arcuate sections in looped relationship to the jug when the latter is resting on the base,

said base having a pair of straight, spaced apart, elongated, horizontally coplanar pieces converging toward the abutment,

said front having a pair of straight, spaced apart, elongated, vertically coplanar members diverging toward the base,

said jug being provided with a handle, the front having a pair of straight, elongated, vertical elements integral with the top and with a corresponding member, coplanar with the members and horizontally spaced, presenting a clearance therebetween for the handle when the jug is resting on the base retained by the top, the members and the elements,

said mount including at least one hook having a horizontal portion projecting rearwardly from said top into and through said hole and a vertical portion projecting upwardly from said horizontal portion at the rear extremity thereof for releasably retaining the hook engaged with said hole,

said hook cooperating with said hole to hingedly attach said top of the rack to the support for swinging of the rack about a transverse, horizontal axis located adjacent said hole as the rack is attached to and detached from the support,

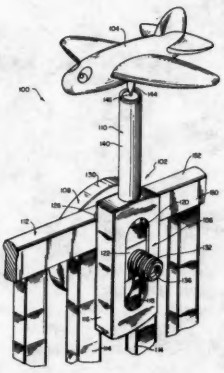
said abutment bearing against said surface of the support and precluding further swinging of the rack about said axis.

4,573,654

MOUNTING STRUCTURE FOR A CRIB TOY

John Nottingham, Richmond Heights, Ohio, assignor to Meritus Industries, Inc., Florham Park, N.J.

Filed Jun. 29, 1983, Ser. No. 509,199
Int. Cl.[4] A47B 96/06; A47G 29/00
U.S. Cl. 248—231.1 7 Claims



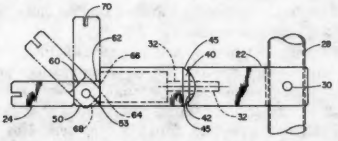
1. A toy assembly for mounting a toy to a crib rail and for supporting said toy on a stand, said assembly comprising a first member, a second member having securing means for securing said first and second members together adjacent said crib rail, and attaching means for attaching said toy to said first member when said first and second members are secured together and to said second member when said second member is arranged as a stand, said securing means comprising a first rod having an internally threaded end and said attaching means comprising a second rod having an externally threaded end, wherein said externally threaded end of said second rod is threadingly received within said internally threaded end of said first rod to provide said stand for supporting a toy.

4,573,655

SWIVEL CLAMP

Sekula Vulic, 319 E. 17th Ave., Columbus, Ohio 43201

Filed Nov. 8, 1984, Ser. No. 669,595
Int. Cl.[4] A47G 29/00
U.S. Cl. 248—278 11 Claims



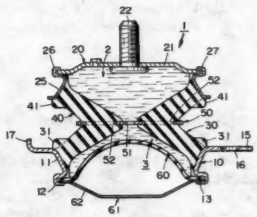
9. A support member comprising in combination, two generally flat members normally disposed in generally co-planar end to end abutting relationship; a pin mounted within said members with its longitudinal axis extending at right angles to the ends of said members abutting one another, one end of said pin being fixed to one of said members and the opposing end of said pin including a removable retaining means; a spring means mounted about the axis of said pin and abutting against a seat provided on one of said members and a thrust bearing disposed between the opposite end of said spring and said retaining means; wherein the entire abutting end of one of said members is formed with a groove extending therealong and the entire abutting end of the other member is formed with a tongue extending therealong adapted to mate with the groove; wherein each of said members may be rotated relative to the other of said members about the axis of said pin.

4,573,656

FLUID-SEALED ENGINE MOUNTING

Hiroshi Yoshida; Takefumi Toyoshima, both of Saitama; Tomio Iwabori; Hideaki Ohkura, both of Kanagawa; Yasuo Miyamoto; Izumi Nishimura, both of Saitama; Toshiyuki Oikawa, Kanagawa; Kenji Sekijima, Kanagawa, and Makoto Ohashi, Kanagawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Hokushin Kogyo Kabushiki Kaisha, Yokohama, both of Japan

Filed Jul. 23, 1984, Ser. No. 633,324
Claims priority, application Japan, Jul. 22, 1983, 58-134826; Feb. 20, 1984, 59-23573[U]
Int. Cl.[4] B60G 11/62
U.S. Cl. 248—562 10 Claims



1. A fluid-sealed engine mounting for mounting an engine on a vehicle frame, comprising:

(a) a connector adapted to be connected to the engine;

(b) a base adapted to be connected to the vehicle frame;

(c) an elastic member joined between said connector and said base and elastically deformable in response to vibrations transmitted thereto, said connector, said base and said elastic member jointly defining a fluid chamber in which a fluid is sealed;

(d) a partition being entirely disposed intermediate said connector and said base and dividing said fluid chamber into a first chamber adjacent to said connector and a second chamber adjacent to said base, said partition having an orifice through which said first and said second chambers communicate with each other; and

(e) a diaphragm mounted on one of said connector or said base for varying the volume of one of said first and second chambers when vibrations are transmitted to the engine mounting, said base comprises a frustoconical tubular body mounted on an end of said elastic member and having a radially outwardly projecting flange on the end thereof closer to said connector, said flange including means for attachment to the vehicle frame.

4,573,657

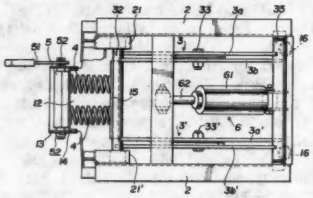
VERTICAL ADJUSTMENT DEVICE FOR A VEHICLE SEAT

Takao Sakamoto, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,766
Int. Cl.[4] B60N 1/02; F16F 1/16
U.S. Cl. 248—575 4 Claims

1. In a vertical adjustment device for use in a vehicle seat including a pair of X-shaped expansion legs provided between a mounting frame and a seat support frame, each of said legs rotatably connected at one end thereof to sliding portions on either said mounting frame or said seat support, and adapted to be free to rotate pivotally at their respective central portions so as to adjust the vertical positions of said seat support frame carrying said seat thereon, the improvement for adjusting cushioning force imparted to said seat comprising an adjustable

cam having a self-stop means and an operation lever cooperatively connected with the sliding portions of said expansion legs by means of springs interposed therebetween to energize



said expansion legs in their sliding direction whereby said cam is rotated to adjust the pre-load elastic forces of said springs and adjust said cushioning force of said seat.

4,573,658

ADJUSTABLE IN-LINE VALVE FOR STERILE FLUIDS

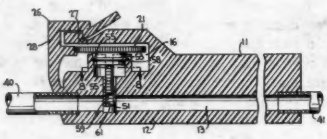
Marvin Gordon, East Windsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Continuation-in-part of Ser. No. 168,722, Jul. 14, 1980, Pat. No. 4,332,369. This application May 12, 1982, Ser. No. 377,429

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.[4] F16K *35/02*

U.S. Cl. 251—95 **10 Claims**



1. A valve for controlling fluid flow through intravenous supply tubing, comprising:

a body member having a longitudinal passage extending therethrough and means for connecting said passage in series with said intravenous tubing, said body member including a first mating element;

selectively movable valve means, including a valve member disposed in said passage, for adjustably blocking the flow through said passage by moving said member within said passage, said valving means including a movable actuator for said valve member at least partially received within said body member and means securing said actuator to said body member;

locking means formed as an integral part of said body member, separate from said actuator and selectively pivotable independently of said actuator between open and closed positions, said locking means including a bearing surface which, in said closed position, bears against said actuator to prevent inadvertent movement of said valve member, said locking means in said open position being out of contact with said actuator to permit movement of said valve member, said locking means further including a second mating element which engages said first mating element to retain said locking means in said closed position; and

sterile sealing means for preventing exposure of said valve member to ambient air when said valve member is partially or fully disposed outside of said passage.

4,573,659

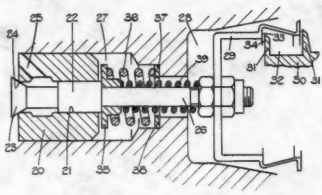
FLUID CONTROL VALVE

Graham D. Homes, London, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 5, 1984, Ser. No. 585,930

Int. Cl.[4] F16K *31/07*

U.S. Cl. 251—129.02 **4 Claims**



1. An electromagnetically operable fluid control valve comprising:

a valve body having a bore therein and spaced apart first and second shoulders in said bore;

an electromagnetic device including an armature which is movable with respect to said valve body;

a valve means movably located in said bore, said valve means including a head for closing said bore when said valve means is in a first position in said bore and for defining an opening into said bore when said valve means is in a second position in said bore, said valve means including an abutment spaced a predetermined distance from said head, said valve means being fixed to said armature for movement therewith;

a spring seat means positioned on said valve means adjacent to said valve means abutment, said spring seat means being slidably mounted on said valve means so that said valve means is movable with respect to said spring seat means, said spring seat means having a first abutment surface positioned for abutment against said valve means abutment and for abutment against said valve means first shoulder when said valve means is in said second position and to abut said valve means abutment but to be spaced from said valve means first shoulder when said valve means is in said first position, said spring seat means further including a first spring seating surface facing toward said valve body second shoulder;

a first spring means seated at one end thereof against said spring seat means first spring seating surface and at another end against said valve means a second shoulder for biasing said valve means toward said second position via said spring seat means; and

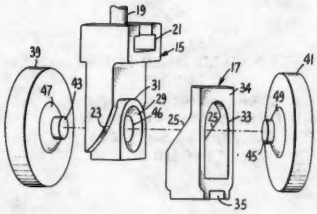
return means for biasing said valve means into said second position with respect to said valve body, said return means including a second spring seating surface on said spring seat means, another spring seating surface on said valve means, and a second spring means seated at one end thereof against said second spring seating surface and at another end against said another spring seating surface for biasing said valve means toward said second position when said valve means is in a third position in said bore with said valve means head being located farther out of said bore in said third position than it is when said valve means is in said second position, said second spring means being biased against said valve body first shoulder via said spring seat means and against said valve means another surface to urge said valve means head toward a bore closing location when said valve means is in said third position yet does not exert any position altering bias on said valve means when said valve means is in said first or second positions.

4,573,660

DOUBLE DISC GATE VALVE

Rodney O. Husted, Montoursville, Pa., assignor to Anchor/Darling Valve Company, Williamsport, Pa.

Filed Nov. 23, 1984, Ser. No. 674,423
Int. Cl.[4] F16K 3/14, 3/24
U.S. Cl. 251—195 5 Claims



1. In a double disc valve comprising a valve body having a pair of substantially parallel seats, a pair of valve discs operatively associated with said seats, respectively, and means for wedging said discs apart and forcing said discs against said seats; the improvement comprising:

a pair of discs, each disc having a valve seat on one side, a central boss on the other side, a spherical surface portion encircling said boss and a relatively flat surface portion around said spherical surface portion;

an upper wedge having a lateral projection formed with a central passage therethrough, a pair of spaced inclined wedge surfaces formed on opposite sides of said central passage, and a spherical surface formed around at least one end of said central passage, the boss of each disc being received in opposite ends of said central passage;

a lower wedge having an elongate slot that receives the projection formed on said upper wedge, a pair of spaced inclined wedge surfaces formed on opposite sides of said slot and engageable with the inclined wedge surfaces of said upper wedge, and a relatively flat surface engageable with the flat surface portions of one disc;

whereby said pair of discs may be interchanged and actuated by either said upper wedge or lower wedge, spherical surface engagement between said upper wedge and disc allowing adjustment for slight non-parallel alignments of valve seats and valve body distortions while providing a uniform distribution of sealing pressure.

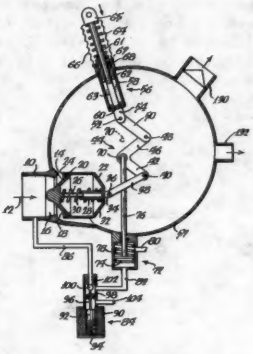
4,573,661

MULTIPLE SCHEDULE VALVE

David N. Chapman, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 15, 1984, Ser. No. 661,062
Int. Cl.[4] F16K 31/52
U.S. Cl. 251—234 14 Claims

14. A multiple schedule valve having two different valve schedules for flow control comprising, a first actuator movable through a variable stroke, a valve member having a full stroke of predetermined length in moving between closed and fully open positions, linkage means including a bell crank interconnecting said first actuator and said valve member such that a predetermined length of stroke of the first actuator effects said full stroke of the valve member, said linkage means being pivotally connected to said valve member, a second actuator, and means responsive to operation of the second actuator to modify the action of said linkage means to vary the relation between the first actuator and the valve member to have the valve member move through less that a full stroke in response



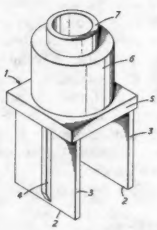
to movement of the first actuator through said predetermined length of stroke.

4,573,662

HYDRAULIC JACK FOR STRESSING ELONGATE ELEMENTS

Javier G. Ripoll, Madrid, Spain, assignor to Stronghold International AG, Liechtenstein, England

Filed Apr. 3, 1984, Ser. No. 596,277
Int. Cl.[4] E21B 19/00
U.S. Cl. 254—29 A 11 Claims



1. A hydraulic jack for use in stressing simultaneously a plurality of elongate elements, the jack comprising:

a body with a front end;

a hydraulically driven tensioning member, including clamping means for the elements and movable away from the said front end to pull the elongate elements so as to stress them;

hydraulic means for driving the tensioning member; and

unclamping means operable to release the said clamping means, the unclamping means being operable in any position of the tensioning member within the range of its said movement and including an unlocking plate located in front of the tensioning member and movable with the tensioning member during its said movement, the unlocking plate being moved towards the tensioning member to provide the said unclamping.

4,573,663

LIFTING DEVICE, ESPECIALLY ELEVATING PLATFORM FOR MOTOR VEHICLES

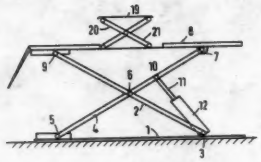
Hans Nussbaum, Bodersweier, Fed. Rep. of Germany, assignor to Hans Nussbaum, Kehl-Bodersweier, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,813

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318550

Int. Cl.[4] B60P *1/54*

U.S. Cl. 254—89 H 3 Claims



1. A device for elevating an automobile, comprising:

a base plate means;

two laterally spaced scissors-type hydraulic jacks mounted to said base plate means;

each said hydraulic jack including a platform constructed and arranged to cooperate with the said platform of the other respective hydraulic jack to support an automobile;

each said hydraulic jack further including a scissors mechanism having two pivotally connected scissor elements with two respective lower ends and two respective upper ends;

each said hydraulic jack having said lower end of one of said two pivotally connected scissor elements thereof pivotally but non-slidably connected to said base plate means, and said upper end thereof both pivotally and slidably connected to the respective said platform;

each said hydraulic jack further having said lower end of the other of said two pivotally connected scissor elements thereof both pivotally and slidably connected to said base plate means, and said upper end thereof pivotally but non-slidably connected to the respective said platform;

pivotal connections of said scissors elements to one another, and of each said pivot element to said base plate means and the respective said platform being about respective generally horizontal axes extending laterally of said device, so that as each said platform is raised and lowered, on each said hydraulic jack the respective scissor element lower ends move towards and away from one another, the respective scissor element upper ends move towards and away from one another, and both scissor element upper ends move away from and towards both scissor element lower ends;

a first extensible/retractable hydraulic piston and cylinder arrangement connected with one of said hydraulic jacks for raising and lowering the respective said platform by pivoting and sliding respective of said pivotal connections of that hydraulic jack; a second extensible/retractable hydraulic piston and cylinder arrangement connected with the other of said hydraulic jacks for raising and lowering the respective said platform by pivoting and sliding respective of said pivotal connections of that hydraulic jack;

a hydraulic pump;

valved hydraulic line means interconnecting said first and second hydraulic piston and cylinder arrangements and said pump, said valved hydraulic line means being constructed and arranged to correspondingly extend and retract said first and second extensible/retractable hydraulic piston and cylinder arrangements by substantially equivalent amounts so that said platforms will remain substantially level with one another as both are raised and lowered, without a need for mechanical interconnection of said hydraulic jacks above said base plate means, apart from such automobile as is supported thereon in use;

said device being characterized by a lack of interconnecting framework between said hydraulic jacks above said base plate means.

4,573,664

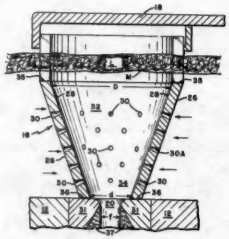
APPARATUS AND METHOD FOR REMOVING INCLUSIONS

Ian D. Prendergast, State College, Pa., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 28, 1984, Ser. No. 687,043

Int. Cl.[4] C21B *3/04*

U.S. Cl. 266—44 11 Claims



1. An apparatus useful for the removal of inclusions from a molten ferrous-based alloy in a continuous casting process, said apparatus comprising a replaceable barrier to flow, that has a plurality of flow-altering perforations, the individual perforations allowing an inclusions-containing molten alloy to pass therethrough and yet disturbing molten alloy flow sufficiently to enhance inclusion agglomeration, whereby molten alloy exiting from said perforations is agglomerated inclusions-enriched, compared to molten alloy entering said perforations;

said barrier to flow having an upper diameter that is of a dimension relative to a lower diameter thereof, that enables agglomerated inclusions within the barrier to float to the molten alloy surface; said lower diameter being sufficient to provide free access of the molten alloy to an outlet from a tundish in which said barrier is to be placed, said barrier being arranged above said outlet;

wherein the sum of the flow-limiting, cross-sectional areas of said individual perforations is at least equivalent to the outlet cross-sectional flow area.

4,573,665

SELF-CONTAINED EXOTHERMIC CUTTING SYSTEM

Robert L. Strohl, Lancaster; Paul E. Moore, Glouster, and Alexander Toth, Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Dec. 3, 1984, Ser. No. 677,458

Int. Cl.[4] B23K *7/00*

U.S. Cl. 266—48 5 Claims

1. A self-contained system for exothermic cutting comprising in combination:

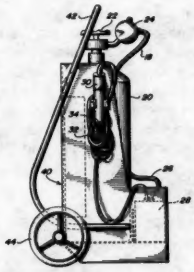
a carrying case;

first means disposed within said case to provide current to a welding electrode;

second means removably disposed with said case to provide a source of oxygen;

a holder for gripping an exothermic electrode said holder

including means to grip said exothermic electrode and conduct current and oxygen to said electrode; and



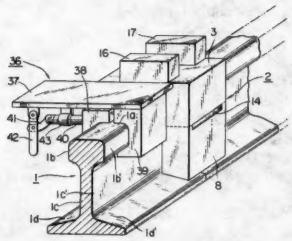
a means for providing a completed electrical circuit for striking an arc with said electrode to initiate the exothermic reaction of said electrode.

4,573,666

APPARATUS FOR QUENCHING BUTT-WELDED PORTION OF RAIL

Hirokazu Nomura; Yukihiko Sato, both of Tsu, and Eiji Morishige, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 630,931
Claims priority, application Japan, Aug. 5, 1983, 58-142478
Int. Cl.⁴ C21D *1/62*
U.S. Cl. 266—80 **8 Claims**



1. An apparatus for quenching a butt-welded portion of a rail, comprising:

an inverse U-shaped cooling box (2) for covering from above and throughout a butt-welded portion of a rail (1), and for quenching said butt-welded portion by ejection of cooling air, said cooling box (2) including two partition plates (9, 10) for dividing said cooling box into a head cooling chamber (3), a web left cooling chamber (7) and a web right cooling chamber (8), which chambers are independent of each other, each of said head cooling chamber, said web left cooling chamber and said web right cooling chamber having a plurality of cooling air nozzles (13) arranged to be directed toward said butt-welded portion;

a cooling air supply mechanism for supplying cooling air to said cooling box (2), said cooling air supply mechanism comprising a cooling air source (20), a solenoid valve (22) for selectively opening and closing the flow of cooling air, a cooling air supply pipe arranged with said solenoid valve for introducing cooling air from said cooling air source (20) into each of said head cooling chamber (3), said web left cooling chamber (7) and said web right cooling chamber (8), a head cooling air regulating valve (16) for regulating a flow rate of cooling air to be supplied to said head cooling chamber (3), a web cooling air regulating valve (17) for regulating a flow rate of cooling air to be supplied to said web left cooling chamber (7) and said web right cooling chamber (8), and valve opening controlling means for controlling an opening of each of said head cooling air regulating valve (16) and said web cooling air regulating valve (17); and

a cooling box holding mechanism (36) for releasably holding said cooling box (2) at a prescribed position so as to cover said rail (1) throughout said butt-welded portion, said holding mechanism comprising

a horizontal supporting plate (37) fixed to a side of said cooling box which extends at right angles to the axial line of said rail,

a pair of clamps (38, 39) located on the lower surface of said supporting plate for gripping the head of said rail to hold releasably said cooling box (2) at a prescribed position so as to cover said rail throughout said butt-welded portion, one clamp (38) of said pair of clamps being slidable at right angles to the axial direction of said rail along the lower surface of said supporting plate, and the other clamp (39) being fixed to the lower surface of said supporting plate,

a horizontally arranged rod (40) fixed at one end to said slidable clamp (38) and projecting at right angles to the axial direction of said rail (1), and

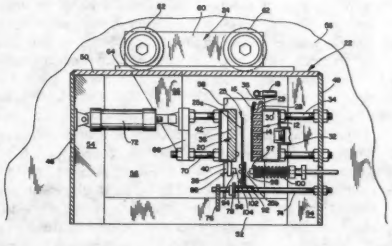
a lever (42) and a link (41) for coupling said lever to the other end of said rod, a top end of said lever being pivotally connected to the lower surface of said supporting plate so that said slidable clamp is guided by said rod and urged by said link to grip the head of said rail in clamping relation with said other clamp when said lever is operated, wherein said cooling box is held at said prescribed position so as to cover throughout said butt-welded portion of said rail.

4,573,667

APPARATUS FOR QUENCHING SUBSTANTIALLY FLAT WORKPIECES

Herbert W. Westeren, Barrington; Ronald A. Harrison, Cranston, and Vartan M. Tavitian, Providence, all of R.I., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Nov. 13, 1984, Ser. No. 670,638
Int. Cl.⁴ C21D *1/62*
U.S. Cl. 266—114 **16 Claims**



1. An apparatus for instantaneously and uniformly quenching a substantially flat metal workpiece after the heating of said workpiece during a heat treatment process comprising:

a. a plate having a substantially flat face thereon, said plate having a plurality of spaced vapor relief apertures therein which extend through said face;

b. an absorbent wick element overlying said face and said apertures therein;

c. means for supplying a liquid coolant to said wick element so that said coolant is absorbed by and dispersed in said wick element, said coolant having a temperature and a vaporization temperature which cause at least a portion thereof to be substantially instantaneously vaporized upon contact thereof with said heated workpiece; and

d. means for urging said heated workpiece into face to face

engagement with said wick element to effect intimate contact of said workpiece with the coolant dispersed in said wick element, whereupon at least a portion of said coolant is vaporized to effect the cooling of said workpiece, at least a portion of the vaporized coolant escaping through said plate apertures to prevent nonuniform cooling of said workpiece as a result of the formation of pockets of vaporized coolant between said workpiece and said wick element.

4,573,668

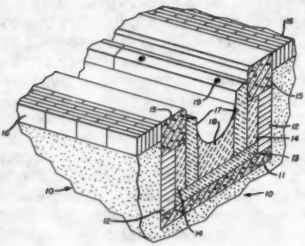
SLAG AND HOT METAL RUNNER SYSTEMS

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Dec. 6, 1982, Ser. No. 447,408

Int. Cl.³ C21B *7/14*

U.S. Cl. 266—196 **8 Claims**



1. In a runner system for a hot metal pouring floor, said runner system extending from a source of molten metal and molten slag to a pouring point thereof, said runner system comprising a substantially permanent elongated trough defining structure having fixed side and bottom portions positioned in said pouring floor an improvement in combination therewith comprising: a replaceable means for lining the runner system, said means for lining said runner system consisting of a plurality of monolithic preformed side wall panels extending from the trough bottom portion upwardly for a significant portion of the distance between the trough bottom portion and a top surface of the pouring floor and at least one monolithic bottom section positioned on the trough bottom portion between said side wall panels to be in abutting relationship with said side wall panels whereby said monolithic bottom section extends completely across the trough bottom section between said side wall panels, said side wall panels and bottom section being formed of sinter alumina in a range from 20% to 60%, silicon carbide in a range from 25% to 45%, fire clay in a range from 10% to 35%, a binder selected from a group consisting of sodium silicate and phosphoric acid that reacts with the other materials, and water substantially 10% by weight, said unitary side wall panels being positioned in said trough defining structure against the sides thereof in oppositely disposed relation to one another and said bottom section being positioned in said trough defining structure on the bottom portion thereof and between said side wall panels and in engagement therewith so as to reinforce said elongated trough defining structure and form a replaceable channel for said molten metal and molten slag.

4,573,669

JAW PLATE

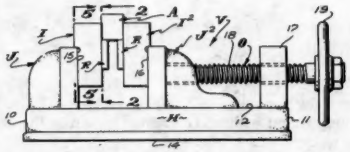
Kenneth L. Gerry, Riverside, Calif., assignor to Guy T. Gerry, Akron, Ohio

Filed Apr. 5, 1985, Ser. No. 720,519

Int. Cl.⁴ B25B *1/24*

U.S. Cl. 269—271 **5 Claims**

1. A machine vise including an elongate bed with opposite sides and ends, longitudinally spaced jaws projecting upwardly from the bed and having longitudinally inwardly disposed opposing faces, operating means between the bed and one jaw to move that jaw longitudinally of the bed and relative to the other jaw, a jaw plate carried by one jaw and including an elongate laterally extending block-like body with an outer face in bearing engagement with the inner face of the jaw and a flat, vertical, inwardly disposed work-engaging surface, releasable fastener means securing the body on the jaw, said jaw plate includes vertically adjustable steady rest means comprising an elongate laterally extending work-engaging bar adjacent and shiftable vertically relative to said work-engaging surface, an elongate vertical through opening with flat, vertical, laterally spaced opposing sides in the body substantially intermediate



the ends thereof, a pair of laterally spaced vertical plate-like wedges with flat outside surfaces slidably engaged with and supported by the sides of the opening and flat, laterally spaced opposing longitudinally outwardly convergent guide surfaces, a guide block on and projecting outwardly from the bar into said opening and having flat, laterally oppositely disposed longitudinally outwardly convergent bearing surfaces slidably engaged with said guide surfaces, a retaining plate fastened to the guide block and engaging the wedges and the body at the outer surface thereof and retaining the body, wedges and block assembled; and an elongate, vertical jack screw carried by the body for free rotation and against axial movement and threadedly engaged through said block.

4,573,670

APPARATUS FOR FOLDING AND STACKING OF CONTINUOUS WEB IN ZIGZAG ARRANGEMENT

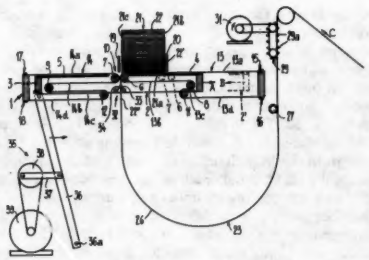
Willi Felix, Strengelbach, Switzerland, assignor to Jos. Hunkeler Ltd., Wikon, Switzerland

Filed Dec. 7, 1984, Ser. No. 679,232

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344260

Int. Cl.⁴ B41L *1/32*

U.S. Cl. 270—39 **12 Claims**



1. Apparatus for producing a stack of zigzag folded web sections from a continuous web of material having predetermined fold lines at which the web is weakened, comprising:

a rack;

a carriage movable between two end positions in reciprocal fashion in said rack;

an opening through the carriage oriented essentially perpendicular to the reciprocal motion of the carriage for the passage of web through the carriage;

said end positions being located to permit movement of said opening from one side of the produced stack to the other side of the produced stack;

guide elements fixedly mounted in said carriage at the side adjacent said stack to define said opening;

a positioning element of flexible material extending from said rack across the side of the carriage adjacent said stack, in the direction of travel of the carriage, to and around the nearest of said guide elements;

each of said positioning elements bending around its associated guide element to separate progressively from the last web section added to the stack as the carriage moves in a first direction and to add a next web section to the stack as the carriage moves in a second direction opposite to said first direction; and

drive means for driving said carriage between said end positions in reciprocal fashion.

4,573,671

AUTOMATIC SETTING DEVICE FOR SLOWING DOWN A SIGNATURE PRIOR TO FOLDING IN PRINTING PRESS CHOPPER FOLDERS

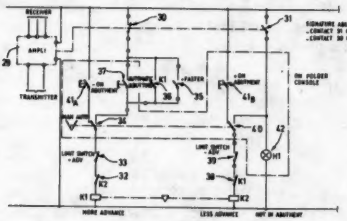
André Reponty, Gouvieux, France, assignor to Harris-Marinoni S.A., Montataire, France

Filed May 6, 1985, Ser. No. 730,647

Claims priority, application France, May 7, 1984, 84 07024

Int. Cl.[4] B41F *13/56*

U.S. Cl. 270—20.1 **13 Claims**



1. A device for automatically setting signature slow down motion before folding thereof in chopper folders used on web fed printing presses, of a type including a sensor to detect the presence of the signature near the folding headstop, and means participating in the folding operation comprising a knife, rollers, vacuum holes, mechanical drive means, an electric motor to set the phase shift, braking brushes, wherein the setting device also comprises a single sensor to detect the presence of the signature to the headstop, a time delay relay linked to said sensor and fitted with a closing switch and an opening switch and two different control circuits for the phase setting motor, a "more advance" circuit with relay means and including the closing switch used to rotate in the "more advance" direction until the sensor opens said closing switch and closes said opening switch, an electric lock contact for relay means in a "less advance" circuit, a "more advance" end of travel contact, a "faster" push button in the press control console and a self-holding relay contact, both of the push button and the relay contact being mounted in parallel to one another, and said "less advance" circuit with relay means comprising said opening contact producing "less advance" until said sensor causes said closing contact to close and said opening contact to open, thereby obtaining precise setting of the signature in abutment.

4,573,672

PAPER FOLDING MACHINE

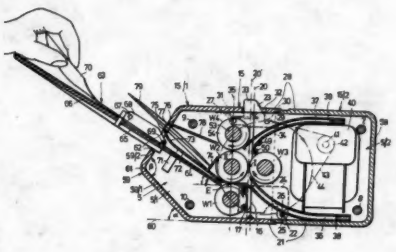
Werner Lehmann, Gutach; Rainer Fecker, Furtwangen, and Manfred Fuss, St. Georgen, all of Fed. Rep. of Germany, assignors to Mathias Bäuerle GmbH, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,182

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405763; Dec. 24, 1984, 3447301

Int. Cl.[4] B42C *1/00*

U.S. Cl. 270—45 **20 Claims**



1. A folding machine for sheet material comprising:

a housing defining a space, having a sheet material in-take opening and a sheet material discharge opening;

a frame in said housing;

first, second, third and fourth rollers rotatably mounted to said frame and disposed in said housing, said rollers extending parallel to each other and defining between said first and second rollers a take-in nip, between said second and third rollers a first folding nip and between said second and fourth rollers a second folding nip:

means defining a feed path in said housing from said in-take opening through said take-in nip, said first folding nip and said second folding nip, and to said discharge opening;

a first pocket in said housing disposed on said path upstream of said first folding nip for facilitating folding of sheet material supplied to said pocket from said take-in nip and to said first folding nip from said pocket;

a second pocket in said housing disposed on said path downstream of said first folding nip for facilitating further folding of sheet material supplied to said second pocket from said first folding nip and from said second pocket to said second folding nip:

drive means connected to said first, second, third and fourth rollers for rotating said rollers to move sheet material along said feed path: and

a feed table connected to said housing and extending toward said in-take opening for at least partly supporting sheet material to be supplied into said in-take opening and onto said feed path:

said housing and said frame each being divided into two parts along a dividing plane which is near a tangent plane to said first folding nip, said two parts being connected to each other for movement between a closed position with said housing space closed around said frame and said rollers, and an open position with said rollers and said pockets exposed and said housing space open, at least said second and said fourth rollers mounted on one of said parts of said frame and said third roller mounted on the other of said parts of said frame, said take-in nip and said second folding nip as well as said in-take opening and said discharge opening of said housing disposed on one side of said tangent plane and said third roller disposed on an opposite side of said tangent plane.

4,573,673

FEED MECHANISM FOR INDIVIDUAL FLAT ARTICLES

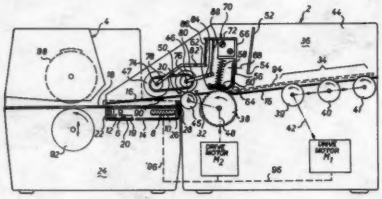
Werner Haug, Langnau, Switzerland, assignor to Frama AG, Switzerland

Continuation of Ser. No. 342,140, Jan. 25, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,961

Claims priority, application Switzerland, Feb. 10, 1981, 883/81

Int. Cl.[4] B65H *3/06, 7/02*

U.S. Cl. 271—111 7 Claims



1. An article feed mechanism for use in association with another device for operating on a flat article as it is fed along an operating path, particularly a franking machine which operates on mail, comprising:

means defining an article feed path adapted to be associated with the operating path of the device;

a stacking area plate in said article feed path adapted to receive flat articles of different size stacked one on top of another;

a lateral wall adjacent said stacking area plate;

a baffle plate having a lower edge spaced from said stacking area plate by a distance to allow at least one article to pass said baffle plate on said article feed path;

first conveyor means disposed along a portion of said article feed path upstream of said baffle plate for feeding articles along said portion of said article feed path, a lowermost flat article being pressed against said first conveyor means by the weight of the articles received on said stacking area plate;

first drive means connected to said first conveyor means to drive said first conveyor means;

second conveyor means disposed along a portion of said feed path downstream of said first conveyor means for feeding an article;

second drive means connected to said second conveyor means to drive said second conveyor means at selected speeds;

a flexible hold-back apron having a part resting on a portion of said second conveyor means;

first sensor means connected to said first drive means and being located along said feed path adjacent said second conveyor means and acting to stop said first drive means when an article is fed along said feed path to said first sensor means;

second sensor means connected to said second drive means and adapted to be connected to the device and acting to stop the second drive means and start the device, said first and second sensor means being located in said article feed path direction downstream of said hold-back apron;

said first sensor means being connected to said first drive means and said second drive means, said first sensor means producing a signal for reducing the conveying speed of said second conveyor means by acting on said second drive means when a trailing edge of the article passes said first sensor means; and

connection means connected to said first and second drive means and connected to the device so that a signal connection is provided between the device and the feed mechanism for restarting said first and second drive means of said first and second conveyor means.

4,573,674

DEVICE FOR DELIVERY OF PAPER SHEETS FOR AN APPARATUS FOR COUNTING THE NUMBER OF PAPER SHEETS

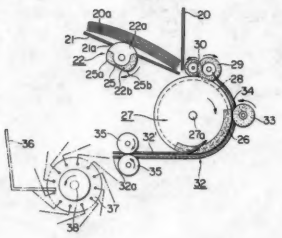
Hiroyoshi Nogi, Tokyo, and Shigeru Tanaka, Kashiwa, both of Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,200

Claims priority, application Japan, Jan. 10, 1983, 58-749[U]

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—118 5 Claims



1. In apparatus for counting a number of paper sheets in which the sheets are stacked on a hopper and fed from the hopper to a payout roll adjacent the hopper by a feed-out, auxiliary roll mounted at a bottom of the hopper, said feed-out, auxiliary roll having a first peripheral surface portion and a second peripheral surface portion forming the remainder of the peripheral surface, said second peripheral surface portion having a coefficient of friction greater than a coefficient of friction of said first peripheral surface portion, characterized in that all points on said second surface portion are spaced from an axis of said feed-out, auxiliary roll by a distance not greater than a radius of said first surface portion and a sheet contacting, peripherally extending portion of said second surface portion, which is less in peripheral extent than the peripheral extent of said second surface portion, has all points thereof spaced from said axis by a distance which is less than the radius of said first surface portion.

4,573,675

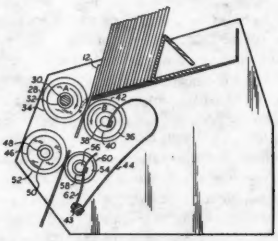
DOCUMENT FEEDER

Eduard Svyatsky, Chicago; K. George Rabindran, Morton Grove, and Thomas J. Faber, Skokie, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 20, 1985, Ser. No. 736,012

Int. Cl.[4] B65H *3/52*

U.S. Cl. 271—122 8 Claims



1. An improved envelope feeder for feeding envelopes downstream in an envelope feeding direction from a hopper positioned above the feeder comprising:

a driving shaft driven in the envelope feeding direction,

a driving roller mounted for rotation on a driven shaft adja-

cent the driving roller so that the circumferences of the rollers define a nip therebetween,

brake means connected to the driven roller for applying a brake force to the roller in a direction opposite the envelope feeding direction,

the driving roller in frictional engagement with the envelope during feeding and applying a feeding force to the envelope, the feeding force transmitted to the driven roller being greater than the brake force causing the driven roller to rotate in the envelope feed direction when a single envelope is in the nip, and the brake force being greater than the feeding force transmitted to the driven roller when two or more confronting envelopes are within the nip so that the driven roller remains stationary while the driving roller continues feeding the envelope in contact with it while the driven roller restrains the envelope in contact with it causing one envelope in the nip to be fed at a time,

spring means applying a spring force to the driven roller for maintaining the circumference of the driven roller in contact with the circumference of the drive roller when no envelope is in the nip and allowing the rollers to separate, automatically adjusting the nip for variations in envelope thickness,

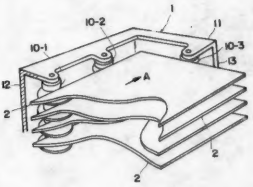
means for causing the driven roller to oscillate between its initial position where it is in contact with the driving roller to a second position where the driven roller is in contact with the driving roller downstream in the envelope feed direction, the oscillation occurring when no envelopes are between and in contact with the rollers and the oscillation stopping when an envelope is between and in contact with the rollers.

4,573,676

SHEET MATERIAL TRANSFER APPARATUS

Hiroshi Miyamoto, Tokyo, and Tadao Omata, Kawasaki, both of Japan, assignors to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,732
Claims priority, application Japan, Feb. 5, 1982, 57-17225
Int. Cl.⁴ B65H *29/42*
U.S. Cl. 271—179 **3 Claims**



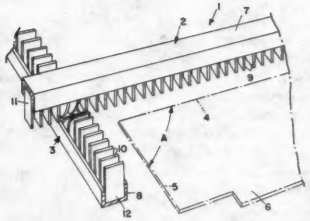
1. A sheet material transfer apparatus comprising at least three externally threaded rods having threads spaced at equal pitches and grooves therebetween, said threaded rods extending parallel to each other and mounted for rotation about respective axes, said threaded rods being driveable for synchronous rotation in a same lead direction to transfer each sheet of material inserted edgewise in the grooves of said threaded rods in said lead direction in synchronism with rotation of said threaded rods, and further comprising means for feeding each said sheet positively and directly into edgewise engagement with a corresponding groove of each of said threaded rods wherein each said sheet is generally polygonal in configuration; means for generally squaring each said sheet, said squaring means comprising at least two of said threaded rods having opposite-handed threading and being rotatable oppositely direction-wise and engageable with separate angularly offset edges of said sheet during said transfer; and means for urging at least one edge of each said sheet against said squaring means during said transfer.

4,573,677

FEED GUIDE STOPS FOR POSITIONING SHEET PRODUCTS

Jean P. Cuir, 36 avenue de Brigode, and Gérard Cuir, 23 Allee des Champs, both of 59650 Villeneuve d'Ascq, France

Filed Jun. 7, 1983, Ser. No. 501,826
Claims priority, application France, Jun. 7, 1982, 82 10273
Int. Cl.⁴ B65H *31/36*
U.S. Cl. 271—236 **12 Claims**



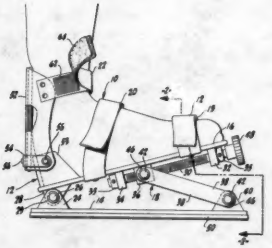
5. A sheet-positioning assembly comprising a pair of guide stops for positioning respective edges of a sheet, which edges define a common angle which is other than a straight angle, and a pair of elongated support means for respectively positioning said guide stops to engage said respective edges which the guide stops position, each of said guide stops including a plurality of spaced thin planar flexible strips extending from a corresponding one of said support means with said strips being arranged with the principal planar surfaces thereof substantially parallel to each other and normal both to a plane of the sheet and to the respective edge of the sheet which said guide stop positions, and the support means being located at different heights and crossing each other by one support means causing the strips of the other support means to bend so that said one support means passes between adjacent bent strips of the other support means.

4,573,678

LOWER EXTREMITY MUSCLE CONDITIONER DEVICE

Steve Lamb, 2772 Sydney Way, Castro Valley, Calif. 94546; Robert R. Moore, 4010 East Ave., Hayward, Calif. 94542, and Frank La Porte, Jr., 3460 Revere Ave., Oakland, Calif. 94605

Filed Jun. 2, 1983, Ser. No. 500,554
Int. Cl.⁴ A63B *1/00, 23/04*
U.S. Cl. 272—96 **6 Claims**



1. Footgear for conditioning the lower extremities of a user's leg comprising a pair of separated, independent platform shoes each shoe comprising:

a base constructed for stable contact with a flat ground surface,

a platform mounted on top of said base said platform having a heel portion and a toe portion, said platform being in-

clined to a selectably fixed position with respect to said base with said toe portion elevated above said heel portion,

an adjustable elevating mechanism interconnecting said platform and base for select adjustment of the angular inclination of said platform with respect to said base, and

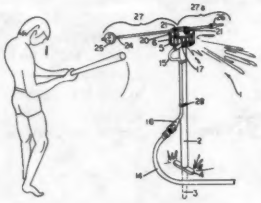
strap means for securing a user's foot to said platform with the user's heel positioned on the heel portion of said platform and the user's toes positioned on the toe portion of said platform, wherein said strap means is adapted to secure said platform shoes to the user's foot when the user lifts his foot from the ground surface during a therapeutic walking regimen; wherein said adjustable elevating mechanism includes a heel pivot and a toe jack, said toe jack comprising a screw with journal blocks and a rotation knob at the end of the screw, a displaceable carriage block threadably engaging said screw, and at least one connecting link connected to said carriage block, said screw and connecting link interconnecting said base and platform wherein upon turning said rotation knob the angular disposition of said platform relative to said base is continuously varied.

4,573,679

WATER POWERED BATTING DEVICE

Jeffrey G. Janszen, 5686 Scarborough Dr., Cincinnati, Ohio 45238

Filed Jun. 25, 1984, Ser. No. 624,021
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E **16 Claims**



1. An amusement device for improving physical coordination of a user and to cool a user with a spray of water, said device comprising:

(1) a ball;

(2) means to tether said ball;

(3) means to rotate said tether means by water propulsion in one direction; and

(4) means to support both said means to tether and said means to rotate, said means to rotate including spray means so that when a user strikes said ball in a manner opposed to said one direction, said means to rotate flings water outwardly therefrom in a spray.

4,573,680

FOOTBALL TRAINING APPARATUS AND METHODS OF USING SAME

James C. McNally, 1831 Poplar Dr., Loveland, Ohio 45140

Filed Mar. 14, 1984, Ser. No. 589,654
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—55 R **18 Claims**

1. An apparatus for training football techniques comprising:

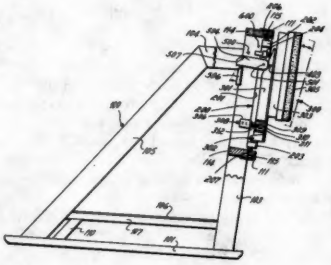
a support frame having a first end and a second end;

a movable frame mounted on said support frame for selective lateral movement between the first and second ends;

an impact member having a padded area, said impact member being mounted on said movable frame for reciprocal movement between an extended and a locked retracted position, the extended position being outwardly and generally toward a player being trained on the apparatus,

means on said movable frame for locking said impact member in a retracted position, said impact member being returnable from its extended position to its locked retracted position by the player;

means for selectively releasing said impact member from its



locked retracted position, said movable frame and said releasing means being adapted for selective simultaneous or independent manipulation by an operator of the apparatus; and

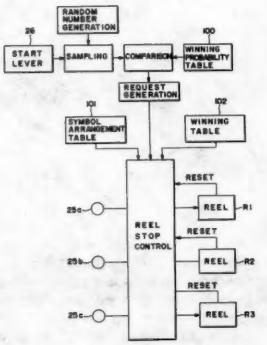
means for advancing said impact member from its released retracted position to its extended position.

4,573,681

SLOT MACHINE WITH RANDOM NUMBER GENERATION

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Apr. 3, 1984, Ser. No. 596,303
Claims priority, application Japan, Apr. 8, 1983, 58-61592
Int. Cl.[4] A63F *5/04*
U.S. Cl. 273—143 R **12 Claims**



1. A slot machine of the type having plural series of moving symbols juxtaposed to each other, each of said plural series of symbols comprising a plurality of moving symbols arranged in an array and in which a predetermined number of coins is ejected when combinations of symbols on prize-winning lines on said array coincide with predetermined prize-winning combinations, said slot machine comprising: random number generator means for generating a plurality of random numbers within a predetermined range; sampling means for selecting one random number out of said plurality of random numbers generated by said generator means; a winning probability table for storing a relationship between a group and said random numbers, the group being one of a plurality of groups made up

by classifying prize-winning combinations; judgment means including means for judging whether the value of said random number corresponds to any of said numerical values representing said groups said judgment means also including means to judge whether a win can be awarded or not and, in the affirmative, further including means for judging to which of said groups said random number belongs, by referring to said winning probability table; hit request signal generator means for generating a hit request signal upon judgment of a win by said judgment means, said signal requesting the machine to stop said moving symbols so as to display one of a particular group of prize-winning combinations in the group judged by said judgment means; and control means responsive to said hit request signal for so stopping said symbols.

4,573,682

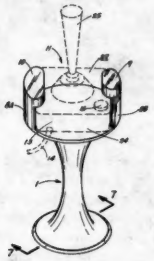
JOY STICK HOLDER

Allen J. Mayon, Franklin, La., assignor to Louis J. Conque, Lafayette and Rodney P. Vincent, New Orleans, both of, La.

Filed Feb. 24, 1983, Ser. No. 469,463

Int. Cl.[4] A63B *71/00*

U.S. Cl. 273—148 B **1 Claim**



1. A stand holder for a computer joy stick, comprising:

a base portion;

a middle portion having a concavo-concave longitudinal section;

a top section provided with a recess to receive a base of the joy stick, wherein the vertical walls of the recess form a square, adaptedly sized to the dimensions of the joystick base, and one of the walls is provided with a notch extending through the walls and through the top section;

a grasping means for securing and retaining the joy stick within the top section; and

wherein the height of the stand and the contour of the middle portion is such so as to facilitate the positioning and gripping of the stand between the thighs.

4,573,683

EDUCATIONAL PUZZLE CUBE

Stewart M. Lamle, 55 W. 86th St., New York, N.Y. 10024, and Mark Setteducati, 218 E. 17th St., New York, N.Y. 10003

Continuation-in-part of Ser. No. 553,494, Nov. 21, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 677,094

Int. Cl.[4] A63F *9/12*

U.S. Cl. 273—157 R **7 Claims**

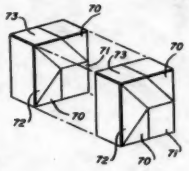
1. An amusement device comprising a solid cube which may be disassembled into a plurality of blocks,

a plurality of differing geometric shapes selected from the group consisting of only isosceles right triangular prisms, cubes, rhomboid prisms, and rectangular prisms comprising said blocks;

a modular unit comprising an isosceles right triangular prism havng a triangular face formed by two legs each of which has a length A and which meet at a right angle, and a hypoteneuse which has a length B, said modular unit having a depth which is equal to A, and a volume which is equal to C, wherein each of said differing geometric shapes is formed from one or more modular units and has a volume equal to an integral number times C; and

wherein said plurality of differing geometric shapes comprise,

(a) four isosceles right triangular prisms each having a volume C;



(b) two cubes each having a volume 2C;

(c) two isosceles right triangular prisms each having a volume 2C; and

(d) two rhomboids each having a volume 2C, whereby the total volume of said solid cube is equal to 16C.

4,573,684

PUZZLES

Alfred T. Riley, 1 Sunfield Dr., Royton, Oldham, and Barry Lord, 93 Helmshore Rd., Holcombe Village, Bury, Lancashire, both of United Kingdom

Continuation of Ser. No. 495,210, May 16, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,224

Claims priority, application United Kingdom, May 18, 1982, 8214494

Int. Cl.[4] A63F *9/10*

U.S. Cl. 273—157 R **7 Claims**

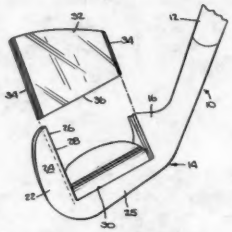
1. A jigsaw toy comprising a plurality of central pieces and edge-defining pieces having first and second faces, at least some of the pieces having cooperating narrow mouthed sockets and enlarged heads for enabling the pieces to be interlocked to form a coherent shape; at least one of said edge-defining pieces being asymmetrical and removable from a first position in which said first face is displayed and is reversible to display said second face, and then replaceable in said first position, has said at least one edge-defining piece also being removable from said first position to a second position, said replacement of said at least one edge-defining piece in said first position and movement of said at least one edge-defining piece to said second position altering the visual effect of said coherent shape without substantially altering the outline of said coherent shape, at least some of said pieces having indicia on at least their first faces such that intelligible composite designs are formed when said first piece displays both its first and second faces in said first position and when said first piece is disposed in said second position.

4,573,685

GOLF CLUB HEAD WITH TRANSPARENT STRIKING FACE

Henry N. Young, IV, and Richard C. Smith, both of Pittsburgh, Pa., assignors to Banff Golf Company, Inc., Pittsburgh, Pa.

Filed Sep. 19, 1984, Ser. No. 651,926
Int. Cl.[4] A63B *53/04, 53/08*
U.S. Cl. 273—173 **6 Claims**



1. A golf club head comprising:

a. a heel portion;

b. a sole portion;

c. a toe portion, said heel, sole and toe portions defining a substantially U-shaped recess; and

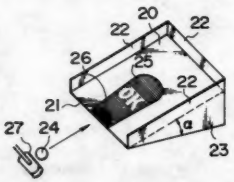
d. a transparent insert, said transparent insert being removably insertable into said U-shaped recess whereby, when inserted, the front of said insert, sole, heel and toe, define the face of said head and a golfer using a golf club including said head can view the playing surface rearward of said sole portion through the front of said transparent insert.

4,573,686

PUTTING TRAINING DEVICE FOR GOLFERS

Yoshiro Nakamats, 1-10-1105, Minami Aoyama 5-chome, Minato-ku, Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,622
Claims priority, application Japan, Oct. 28, 1982, 57-188182
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—184 A **7 Claims**



1. A training device for golf games comprising, in combination:

(a) an imperforate member providing a generally rectangular sloping surface (20) having a forward edge (21) adapted to be disposed flush with a supporting surface (3) for the device,

(b) upstanding golf ball-confining wall means (22) extending upwardly from said sloping surface (20),

(c) first visually-observable indicia disposed on said sloping surface (20) and forming an inverted generally U-shaped discrete ball-rolling zone (25) extending rearwardly from said forward edge (21),

(d) said generally U-shaped zone having side portions spaced inwardly from adjacent said ball confining wall means (22) and disposed angularly thereto and converging to spaced terminus portions at said forward edge (21),

(e) and second visually observable indicia (26) positioned on said U-shaped zone adjacent said forward edge (21) and extending between and of the same width as the distance between said spaced terminus portions of said generally U-shaped zone (25),

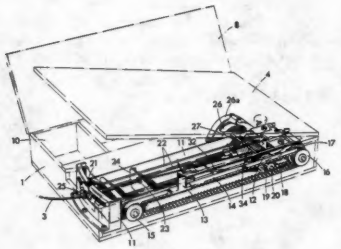
(f) said second indicia (26) defining at least a portion of a simulated target hole for a golf ball (24).

4,573,687

GOLF TRAINING DEVICE

Kari-Ivar Nilsson, Linkoping, Sweden, assignor to Klintland, Linkoping, Sweden

Filed Jun. 16, 1983, Ser. No. 504,831
Claims priority, application Sweden, Jun. 29, 1982, 8204011
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—184 B **4 Claims**



1. A golf training device comprising each of the following elements in combination: a frame (1), a golf ball (2) which before a shot is placed on a specific place relative to the frame (1) and which is also joined to one end of a cord (3), while the other end of said cord (3) is joined to a cylindrical drum (12) which is mounted in bearings in the frame (1) to allow it to rotate and around which most of said cord (3) is wound and a device operatively connected to the drum (12) arranged to take up the kinetic energy which the golf ball (2) obtains at the shot, to indicate a corresponding distance and to lock the drum (12) the same moment as the ball (2) stops after the shot, and characterized in that, said device consists of a wind up spring which is a radially wound up leaf type spring with an approximately constant wind up force arranged to be tightened when the cord (3) is wound off the drum (12) at the shot and that the drum (12), which is arranged to have a low moment of inertia, has a track (33) designed for the cord (3) which like a thread with a specific pitch runs along said drum, said track including a groove in the drum extending continuously around the drum and from one end of the drum to the other.

4,573,688

GAMEBOARD APPARATUS WITH SEPARATING DIE

John T. Grimes, 412 Brooks #D, Venice, Calif. 90291

Filed Jul. 29, 1983, Ser. No. 518,471
Int. Cl.[4] A63F *3/00, 9/04*
U.S. Cl. 273—241 **21 Claims**

1. A game apparatus comprising

a gameboard having a plurality of playing fields each bounded within a triangular configuration having apices and sides,

a plurality of plateaus mounted in each of said playing fields,

a series of stations spaced from one another on each of said plateaus,

means operatively connecting together said spaced stations and for indicating direction of movement for a marker applied during play to said stations mounted between said stations,

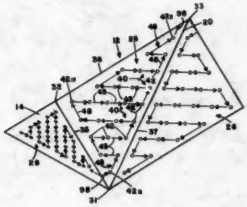
means for climbing from one of said plateaus to the next adjacent plateau mounted at corresponding ends for said one of said plateaus and next adjacent plateau,

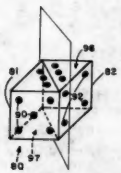
said series of stations including nadir and zenith stations in their own respective plateaus for corresponding entry and exit of play on the corresponding playing field, they being mounted immediately adjacent their associated and corresponding apices,

at least one plateau having a maximum width and two plateaus having minimum widths in said plurality of plateaus, the plateaus having minimum widths occurring at said nadir and zenith stations, and

means for directing a marker to a next playing field mounted across the sides of two adjacent playing fields and extending from the zenith station on each playing field, to thereby provide for play on all playing fields by the same marker.

21. A gamepiece comprising





a pair of cooperating and identical but completely separate members,

each member being in the form of one-half of a rectangular parallelpiped, solid throughout, having a diagonal base, the bases of the respective members being mated so as to form a cube having six sides,

indicia mounted on said diagonal base and on each of the other four sides forming such one half,

the solidity of each member comprising an ert eraser compound substance and a polyurethane base, thereby providing the qualities of resiliency and adherency,

whereby the cube is not separated into its members when thrown and retains a springiness from the force with which it strikes a surface.

4,573,689

GAME

S. Ray Sultzbaugh, 3900 Parkview La., #11-A, Irvine, Calif. 92715

Filed Aug. 13, 1984, Ser. No. 639,841

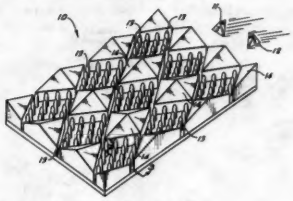
Int. Cl.[4] F41J *1/00*; A63F *5/04*

U.S. Cl. 273—348 **9 Claims**

1. In a game board and throwing piece combination of the type wherein the throwing piece may land with any of its surfaces facing upwardly depending only on chance, the improvement comprising:

at least one regular tetrahedron which comprises the throwing piece;

a game board having at least three pegs positioned to form a triangular pattern, said pegs being held in a generally upright manner and said pegs being positioned sufficiently close together and having sufficient height so that the regular



tetrahedron will be about parallel to the upper surface of the pegs.

4,573,690

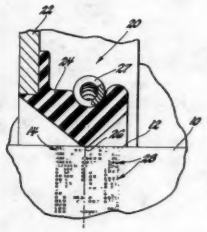
SEALING SURFACE AND METHOD

Arnold O. DeHart, Rochester, and James D. Symons, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1984, Ser. No. 681,380

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—1 **4 Claims**



1. An improved configuration for the sealing surface of a body movable relative to the lip of a seal along a path in one direction and in close proximity to said lip so as to be capable of shearing a lubricant between said lip and said sealing surface, comprising;

a multiplicity of substantially identical indentations formed into said sealing surface as said configuration, each indentation having a sloped wall converging relative to said path in said one direction and merging smoothly with said sealing surface, each indentation having a predetermined uniform spacing along said path from each adjacent indentation so as to create a multiplicity of uniformly spaced seal support pads between the indentations,

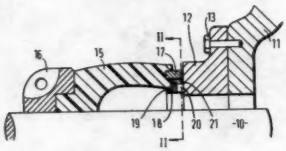
whereby the shearing action caused by said seal lip moving relative to said sealing surface pumps lubricant from said indentations at a low pressure at said sloped walls to a higher pressure at said seal support pads due to the smooth merging of said sloped walls with said sealing surface, the predetermined uniform spacing between the indentations serving to maintain substantially the same higher pressure over each seal support pad to thereby provide load support to said moving seal lip.

4,573,691

MECHANICAL FACE SEALS

Samuel C. W. Wilkinson, Chidham, England, assignor to Crane Packing Limited, Slough, England

Filed Nov. 9, 1984, Ser. No. 669,950
Claims priority, application United Kingdom, Nov. 12, 1983, 8330256
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—96.1 10 Claims



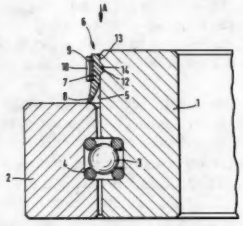
1. A mechanical face seal for producing a fluid tight seal between a pair of relatively rotatable components comprising a first sealing element associated with one of said components and fixed axially with respect to the component, a second sealing element associated with the other component and movable axially with respect to the component, means for sealing the second sealing element with respect to its associated component and loading it axially into sealing engagement with the first sealing element, and a thrust bearing arranged in parallel with the first and second sealing elements to partially reduce the load applied to the sealing elements.

4,573,692

LIP SEAL WITH ELASTIC ATTACHING BAND

Hubertus Frank, Höchstadt, and Rainer Gebauer, Bamberg, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jul. 15, 1985, Ser. No. 755,295
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426805
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—152 10 Claims



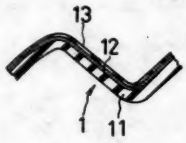
1. A seal assembly for sealing between two elements, at least one of the elements having a cylindrical surface supporting a seal made of an elastic material provided with a sealing lip bearing against the second element, the improvement comprising that the seal consists of a hollow-cylindrical body from which a sealing lip projects from at least one face and the body bears against the cylindrical surface of the one element and is encircled by an elastic band of polymeric material to hold the body in place.

4,573,693

DUST BOOT WITH MULTIPLE LAYER CONSTRUCTION OF BELLOWS

Rikizo Nakata, Nakashima; Tadaoki Okumoto, Inazawa; Mikio Ukai, Nagoya; Takamasa Suzuki, Konan, and Tomoyoshi Yamada, Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 24, 1985, Ser. No. 726,465
Claims priority, application Japan, Apr. 26, 1984, 59-84679
Int. Cl.[4] F16J *15/52*
U.S. Cl. 277—212 FB 5 Claims



1. A dust boot for covering a joint portion of a constant velocity universal joint, comprising:

a bellows-shaped main body made of chloroprene-rubber substantially excluding wax and having one opening end fit on one joint member and the other opening end fit on the other joint member;

a primer layer made of a mixture of chloroprene-rubber and isocyanate compound and formed on the surface of said main body; and

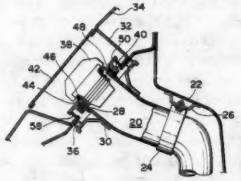
a covering layer made of polyamide resin and formed on the surface of said primer layer.

4,573,694

FUEL FILLER SYSTEM FOR AN AUTOMOTIVE VEHICLE

Shinji Goto, Chigasaki; Takao Kingo, Hadano; Akira Ochi, and Yoshiro Yoshikawa, both of Hiratsuka, all of Japan, assignors to Nissan Shatai Company, Limited, Hiratsuka, Japan

Filed Mar. 15, 1984, Ser. No. 590,078
Claims priority, application Japan, Mar. 30, 1983, 58-52778
Int. Cl.[4] B65D *25/40*
U.S. Cl. 280—5 A 6 Claims



1. A fuel filler system for an automotive vehicle comprising:

a fuel tank;

a filler well defined as a recess in the body of the vehicle and having an opening in an outer vehicle body panel;

a fuel filler tube leading from the fuel tank, passing through said opening and opening outside the vehicle body within the filler well, the open end of the filler tube being sealed by a removable filler cap, said fuel filler tube being provided with a threaded section adjacent said opening end within said filler well;

a flange having an internal threaded section engageable to said threaded section of said filler tube and extending parallel to the outer vehicle body panel between said opening and said filler cap, the diameter of said flange being greater than that of said opening, said flange being attachable to and detachable from said filler tube independently of other elements of the fuel filler system and hav-

ing an annular section facing a peripheral edge of said opening in spaced apart relationship; and

a seal, interpositioned between said annular section and said peripheral edge of said opening, for closing a clearance between said annular section and said peripheral edge of said opening and for preventing said flange from contacting said body panel.

4,573,695

SLED APPARATUS

Gordon H. Kennel, Box 1794, Havre, Mont. 59501

Filed Apr. 30, 1984, Ser. No. 605,114

Int. Cl.[4] B62B *13/16, 13/18*

U.S. Cl. 280—20 14 Claims

1. Sled apparatus including a body supporting portion, a runner portion, a runner supporting portion and a steering portion; said body supporting portion including an elongated frame section with longitudinal edges and front and rear ends, said frame section including rigid peripheral edges, said frame section including two generally quadrangular members, said quadrangular members being disposed in an end to end relationship and pivotally connected to one another; said runner portion including a runner disposed below and spaced from each longitudinal edge of said frame section, said runners extending substantially the full length of said frame section, each runner including forward and rear runner sections selectively connectable in an end to end relationship when said quadrangular members are disposed in a single plane; said runner supporting portion including a plurality of spacer sections extending between said runner sections and said longitudinal edges of said frame section, each of said spacer sections having one end pivotally connected to a longitudinal edge and an opposite end rigidily affixed to a runner section, the spacer sections affixed to each forward runner section being disposed remote from said front end to said frame section, cross members joining spacer sections that extend from opposite longitudinal edges of said frame section, each cross member being pivotally connected to one of the joined spacer sections and being selectively engageable with the other of the joined spacer sections; said steering portion including a transverse bar member disposed adjacent said front end of said frame section symmetrically with respect to said longitudinal edges of said frame section, said transverse bar member being pivotally connected to said front end of said frame section at the center thereof, connector bars each having one end pivotally connected to a free end of each forward runner section adjacent said front end of said frame section, said connector bars extending to one another with adjacent ends being pivotally connected to a central rearward extension of said transverse bar member.

4,573,696

SELF-PROPELLED RECREATIONAL VEHICLE

Arthur N. Buroff, 1500 St. Georges Ave., Rahway, N.J. 07065

Filed Mar. 28, 1984, Ser. No. 594,279

Int. Cl.[4] B62M *1/04, 1/14*

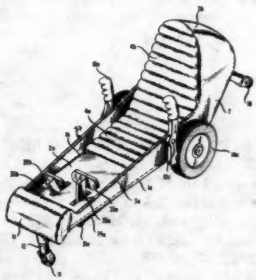
U.S. Cl. 280—247 7 Claims

1. A self-propelled vehicle comprising in combination a substantially rigid frame in the form of a seat portion having an elongated leg rest, and a backrest secured to said seat portion and forming therewith in a vertical plane an internal angle between about 90 and 120 degrees;

an axle having a pair of drive wheels rotatably mounted at opposite ends of said axle;

means for supporting said frame on said axle at the rear of said seat portion in a position adjacent the junction between said leg rest and said backrest comprising at least one supporting member projecting from said frame, and including bearing means journaled on said axle;

in normal operating position, means for supporting the leg rest above the ground comprising a supporting post projecting downwardly in a substantially vertical direction from said leg rest and terminating in a first auxiliary wheel substantially smaller than said drive wheels, said first auxiliary wheel resting on the ground in said normal operating position;



a second supporting post substantially centered on and projecting outwardly and downwardly from the upper rear surface of said backrest, said second supporting post terminating at its outer end in a second auxiliary wheel similar in size to said first auxiliary wheel, said second auxiliary wheel being maintained above the ground in said normal operating position; and

means for simultaneously rotating said drive wheels for propelling said vehicle in a forward linear direction;

whereby when said entire frame including said seat portion and said backrest is rotated rearward through a small angle not exceeding about 30 degrees to an upended position, said first auxiliary wheel is lifted off of the ground and said backrest is supported substantially parallel to the ground on said second auxiliary wheel and the rotation of said drive wheels continues to propel said vehicle in a forward linear direction.

4,573,697

MOTORCYCLE

Günther Schier, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,648

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411561

Int. Cl.[4] B62K *25/08*

U.S. Cl. 280—276 9 Claims

1. A motorcycle comprising a front wheel, a motorcycle frame means, a spring-damping means operatively connecting the front wheel with the motorcycle frame means, a gas pressure space means acted upon by the spring-damping means, a pressure reservoir, and closure means operatively connecting the gas pressure space means with the pressure reservoir during braking of the motorcycle, the closure means being constructed as control valve means having a vent channel for the gas pressure space means and a closure slide valve member

displaceable by the deceleration of the motorcycle and operatively connected with the gas pressure space means, said closure slide valve member being operable in its normal position

to close the connection from the pressure reservoir to the gas pressure space means and opening up the venting of the gas pressure space means.

4,573,698

MOTORCYCLE STEERING MECHANISM

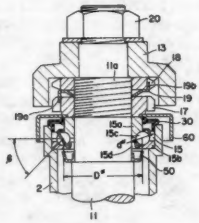
Hirotake Takahashi, Sayama, and Kenji Nishikawa, Tokorazawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 541,938

Claims priority, application Japan, Oct. 14, 1982, 57-180502; Dec. 10, 1982, 57-215378

Int. Cl.[4] B62K *21/06*

U.S. Cl. 280—279 **8 Claims**



1. A handle bar steering device for a motorcycle having a steering column with angular bearings to permit swing steering, wherein said bearings comprise angular ball bearings having a swing angle of at least 50°, and being retained out of contact with one another by a retainer element, said device comprising a head pipe and friction means between said head pipe and steering column to provide turning friction resistance for the latter, said device further comprising upper and lower angular ball bearings, said upper ball bearings being affixed to a threaded upper portion of said steering column by means of a first nut, tightening of said first nut producing a substantially equal pressure on both said upper and said lower ball bearings, a second nut being threaded upon said threaded upper portion of said steering column, a lock washer being provided between said first and second nuts, each of said first and second nuts having a plurality of stop tabs projecting around its circumference and forming a plurality of stop notches, and said lock washer having a larger and a smaller pair of opposite stop tabs located at 90° intervals around its circumference, said respective pairs being bent at substantially 90° angles in respectively opposite directions so as to engage the respective stop notches of said first and second nuts.

4,573,699

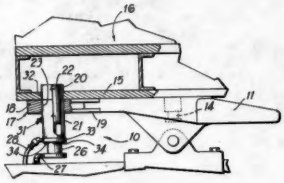
TRAILER BACK-UP COUPLING

Ronald F. Smith, Monroe, Wash., assignor to Safety Equipment Corporation, Monroe, Wash.

Filed Jul. 27, 1984, Ser. No. 635,167

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—432 **5 Claims**



1. A coupling for articulated vehicles having a fifth wheel to enable straight line backing up of the vehicle, said coupling comprising a prefabricated power-operated locking plunger assembly including a narrow crescent-shaped mounting plate segment fixedly attached to a curved frontal edge of a fifth wheel, said assembly further including a locking plunger, and a cooperative locking bushing fixedly attached to a trailer king pin plate and being adapted for coaxial alignment with said locking plunger of said assembly.

4,573,700

SKI BRAKE

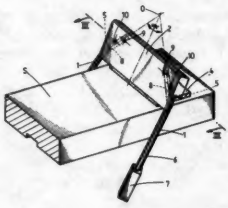
Jean Beyl; Jean Bernard, both of Nevers; Daniel le Faou, Coulanges-les-Nevers, and Henri Peyre, Nevers, all of France, assignors to STE Look, Nevers, France

Filed Feb. 28, 1984, Ser. No. 584,391

Claims priority, application France, Mar. 17, 1983, 83 04362

Int. Cl.[4] A63C *7/10*

U.S. Cl. 280—605 **5 Claims**

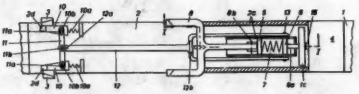


1. A ski brake comprising two movable braking arms which are intended to be placed on each side of a ski and the active ends of which are inwardly withdrawn above the ski in their raised position whilst the opposite control ends of said braking arms are associated by means of an operating pedal which can be actuated by the corresponding ski boot, wherein the braking arms are carried solely by the operating pedal which is pivotally mounted on the ski and capable of pivotal displacement about a transverse axis, the corresponding control ends of said arms being elbowed in order to form a V whose point is directed away from the active ends of said arms and/or away from the ski, said control ends being rotatably mounted within bores having the same angular orientation and formed in the operating pedal, means being provided for causing said control ends of the braking arms to rotate about their own axes within said bores after completion of the upward displacement of said braking arms in order to bring the active ends of said arms to their inwardly withdrawn position above the ski in the standby position of said ski brake.

4,573,701
RELEASE SKI BINDING

Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Klaus Kruschik, Gumpoldskirchen, and Robert Taucher, Podersdorf, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jan. 19, 1984, Ser. No. 572,100
Claims priority, application Austria, Jan. 21, 1983, 190/83
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—616 10 Claims

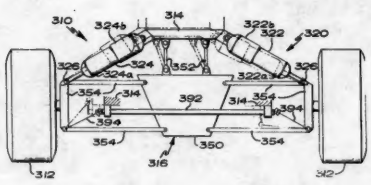


1. In a release ski binding comprising a sole plate which can in its central region be pivoted about an approximately vertical axis and about a transverse axis arranged in front of said vertical axis, said sole plate being held on a ski in a skiing position by a resilient holding mechanism, said holding mechanism being responsive to a pivotal movement of said sole plate relative to the ski and, upon reaching a predetermined angle of traverse effecting both an upwardly and also a side opening of a locking mechanism, the improvement comprising wherein said locking mechanism has two clamping jaws which laterally engage the ski shoe and which are constructed as two-arm levers, mounting means for mounting said clamping jaws pivotally on the sole plate and for movement about axes which extend in the longitudinal direction of the ski, wherein a heel holder is provided on said sole plate and which is pivotal about a transverse axle between a ski shoe holding position a ski shoe releasing position, and wherein said transverse axle of said heel holder is supported for movement in the longitudinal direction of the ski and is under the influence of a resilient means for urging said heel holder toward the tip of the ski, and wherein control means are provided for operatively controlling the operation of said clamping jaws and said heel holder.

4,573,702
ANTI-PITCH SUSPENSION

Richard H. Klem, 35 N. Highland St., Arlington, Va. 22201

Continuation-in-part of Ser. No. 361,534, Mar. 23, 1982, Pat. No. 4,484,767. This application Sep. 30, 1982, Ser. No. 428,922
The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.
Int. Cl.[4] B60G 3/00
U.S. Cl. 280—697 7 Claims



6. An anti-roll suspension for suspending at least one wheel from a vehicle body, said suspension comprising:

a wheel supporting means, at least one of said wheels being mounted to said supporting means;

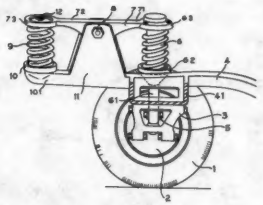
a torsional bar mounted to said vehicle, said bar having at least a first actuating arm; and

means suspending said body from said wheel supporting means, said suspending means comprising means for translating the lateral inertia of said vehicle body during cornering into lateral translational movement of said vehicle body relative to said supporting means, said translating means comprising at least a first link and said supporting means comprising at least a first attachment point, said first actuating arm being above and toward the center of said vehicle relative to said attachment point, said link connecting said attachment point and said first actuating arm, said link angling upwardly and inwardly from said point to said arm.

4,573,703
VEHICLE SUSPENSIONS

Virgil S. Linger, 3555 Bradley Brownlee Rd., Cortland, Ohio 44410

Filed Jan. 16, 1984, Ser. No. 571,104
Int. Cl.[4] B60G 3/00
U.S. Cl. 280—701 6 Claims



1. A vehicle having a frame and a generally vertically-disposed MacPherson strut suspension carried by the frame and connected to a vehicle wheel, said MacPherson strut comprising

a shock absorber including relatively movable parts in the form of a cylinder and a piston within said cylinder, said piston having a rod connected to it and extending outwardly of said cylinder, and said MacPherson strut also including a coil spring surrounding a portion of said shock absorber,

a walking beam disposed longitudinally of said frame and pivoted intermediate to its ends on said frame,

one of said relatively movable parts of said shock absorber being movable vertically with the wheel axle and the other of said movable parts being connected to one arm of said walking beam,

said shock absorber having a spring platform connected to it and facing upwardly and said one arm having a spring platform connected to it and facing downwardly, said coil spring being compressed between said spring platforms, and

the other arm of said walking beam having a spring platform facing downwardly, and a cushioning device compressed between this spring platform and a portion of said vehicle frame.

4,573,704
INTERNAL LIFT AXLE SUSPENSION SYSTEM

Ervin K. VanDenberg, Massillon, and Jim Eckelberry, Canton, both of Ohio, assignors to Turner Quick-Lift Corporation, Canton, Ohio

Filed Jan. 20, 1982, Ser. No. 340,940
Int. Cl.[4] B60G 11/26
U.S. Cl. 280—704 14 Claims

1. In a lift axle suspension system for a frame-membered wheeled vehicle comprising an extendible air chamber, means for stabilizing said air chamber, a lift mechanism for raising the system out of road engagement and means for extending said air chamber thereby to lower said system into road engagement, the improvement comprising as said lift mechanism, a mechanism located completely within the internal confines of said air chamber, said mechanism being of a size sufficient to

raise the system to the desired height above the road and to effectively lower the system into full engagement with the road, wherein said air chamber comprises an upper and a lower

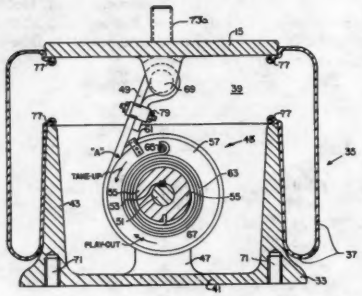


plate member and a flexible sleeve located within said plate members; and wherein one of said plate members includes a circumferential wall extending inwardly into said chamber and which substantially surrounds said lift mechanism.

4,573,705

SUSPENSION AND STEERING CONTROL OF MOTOR VEHICLES

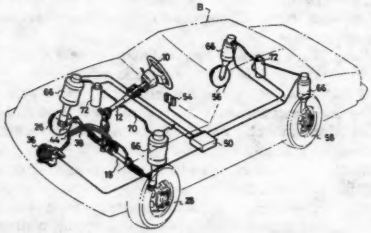
Seita Kanai, and Hirotaka Kanazawa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 18, 1983, Ser. No. 553,390

Claims priority, application Japan, Nov. 22, 1982, 57-204795; Nov. 22, 1982, 57-204796; Nov. 22, 1982, 57-204797

Int. Cl.[4] B60G *17/08*

U.S. Cl. 280—708 **16 Claims**



1. A motor vehicle comprising: a body, wheels for supporting said body and including steerable wheels, first suspension means between said body and at least one of said wheels, second suspension means between said body and another of said wheels, manually operated steering means for steering said steerable wheels, said first suspension means including first resistance means for providing a first resistance level to vertical movements of said body with respect to said wheels, said second suspension means including second resistance means for providing a second resistance level to vertical movements of said body with respect to said wheels, one of said first and said second resistance means being a variable resistance means, first adjusting means for adjusting the resistance of said variable resistance means of at least one of said first and said second suspension means to change the ratio of said first resistance level to said second resistance level, second adjusting means for adjusting the operating force necessary to operate said steering means, control means for providing a control signal to said first adjusting means for adjusting the ratio of the first resistance level to the second resistance level of said first and second suspension means and for providing a control signal to the second adjusting means to adjust the operating force necessary to operate said steering means in predetermined relationship to the adjustment of said ratio of the first to the second resistance levels of the first and second suspension means, and switch means operatively connected to said control means for selectively providing desired adjustment of said variable resistance means and desired adjustment of the force necessary to operate said steering means.

4,573,706

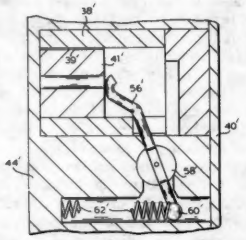
PASSENGER COMPARTMENT SENSOR REQUIRING SUBSTANTIAL VELOCITY CHANGE

David S. Breed, Boonton Township, Morris County, N.J., assignor to Breed Corporation, Lincoln Park, N.J.

Filed Feb. 15, 1984, Ser. No. 580,337

Int. Cl.[4] B60R *21/32*

U.S. Cl. 280—734 **15 Claims**



1. A mechanical sensor with a low bias for mounting within a vehicle passenger compartment operable without electrical power for igniting the pyrotechnic element of an air bag safety restraint system for the vehicle, said sensor comprising a sensor train which includes:

a primer;

a spring biased firing pin;

a means responsive to sustained acceleration above the bias for releasing the firing pin to strike the primer.

4,573,707

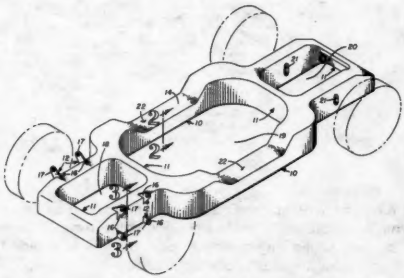
COMPOSITE LIGHTWEIGHT NON-METALLIC VEHICLE FRAME

Rudolf D. Pabst, N. 7511 Panorama Dr., Spokane, Wash. 99208

Filed Jan. 30, 1984, Ser. No. 575,289

Int. Cl.[4] B62D *29/04*

U.S. Cl. 280—792 **7 Claims**



7. A non-metallic ladder type automotive frame having beam elements formed of composite plastic materials, comprising in combination:

paired opposed elongate lateral beams interconnected by

plural cross beams, each of said beams and cross beams having,

a rigid lower density core formed by foaming plastic material in a peripheral mold to create a structure having closed cells and a graduated density that is greatest at the periphery of the core, and

a higher density peripheral skin formed of polymeric matrix material adhered to the core and embedding reinforcing fiber in the form of woven cloth, plural layers of said cloth, covering the peripheral surfaces of the beams and additional layers of said cloth covering top and bottom portions of the beams, and

means of releasably fastening automotive components to at least some of the beams.

4,573,708

ARRANGEMENT IN VEHICLE SAFETY BELTS OF THE THREE-POINT TYPE

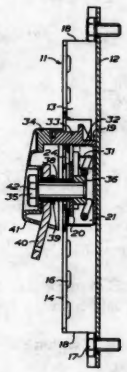
Tommy K. L. Brorsson, Örkelljunga, Sweden, assignor to Safety Transport Inter Development AB, Anderstrop, Sweden

Filed Jan. 17, 1984, Ser. No. 571,469

Claims priority, application Sweden, Jan. 17, 1983, 8300192

Int. Cl.⁴ B60R *22/00*

U.S. Cl. 280—808 **8 Claims**



1. An arrangement in vehicle safety belts of the three-point type for adjusting stepwise the height of the anchoring fitting located at shoulder level at one side of the seat, comprising a fixedly mounted guide rail having U-shaped cross-sectional form and edge flanges projecting towards each other, which define a longitudinal slot and form a plurality of recesses distributed along the slot, and a slide supporting the anchoring fitting, which is displaceable along the guide rail and has an engagement element displaceable in the transverse direction of the web of the guide rail for releasable engagement with the recesses in a desired longitudinally displaced position with the engagement element spanning the slot between the edge flanges, the engagement element being engaged with the recesses under spring bias and being disengageable from the recesses against the spring bias by means of an operation member arranged outside the guide rail to be operated manually, characterized in that the anchoring fitting is arranged on the engagement element and that the slide comprises a lock element connected with the operation member and displaceable in relation to the engagement element in the longitudinal direction of the guide rail, said lock element being guided for longitudinal displacement in the guide rail in engagement with the web and edge flanges thereof, the engagement element being guided on the lock element to be displaced transversally of the web of the guide rail by relative displacement in the longitudinal direction of the guide rail, said engagement element and the lock element being guided for relative displacement by at least one guide slot in one element and a guide pin engaging said slot on the other element, and said at least one guide slot having a straight portion to receive therein the guide pin under the spring bias with the teeth of the engagement element engaging the apertures in the edge flanges of the guide rail, and another portion angled in relation to said straight portion, for guiding the engagement element towards the web of the guide rail at relative displacement of the engagement element and the lock element against the spring bias.

4,573,709

LATCH DEVICE FOR A WEBBING ANCHOR

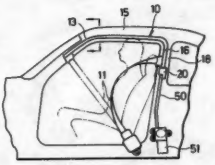
Osamu Kawai, Fujisawa; Kazuo Yamamoto, Sagamihara, and Yoshihiro Yokote, Yokohama, all of Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,135

Claims priority, application Japan, Jun. 21, 1983, 58-94217[U]

Int. Cl.⁴ B60R *21/00*

U.S. Cl. 280—804 **7 Claims**



1. A latch device for a webbing anchor used in the seat belt system of a vehicle, said device comprising:

a guide rail disposed in the vehicle with a predetermined locus;

an anchor to which the end of webbing is fixed and which has an engaging pawl, said anchor being engaged with said guide rail for movement along the track of said guide rail;

a driving member slidable along said guide rail and engaged with said anchor so as to be relatively displaced by a predetermined amount in the direction of sliding movement, said driving member having a hole, said driving member being adapted to drive said anchor on said guide rail to bring the same to a seat occupant restraining position and a seat occupant non-restraining position; and

a latch member fixedly disposed adjacent to said driving member and having an engaging portion engageable with the engaging pawl of said anchor and a cam portion forming cam means with said driving member,

said cam portion being formed so that it fits into the hole of said driving member as said anchor is driven to said seat occupant restraining position by said driving member, and is further displaced in said hole relative to the driving member of a predetermined length, and that it is pushed out of said hole thereafter as said anchor is driven away from said seat occupant restraining position by said driving member;

said engaging portion coming to a position in which it is engageable with the engaging pawl of said anchor by said fitting and said displacement of said cam portion and coming to a position in which it is unengageable with the engaging pawl of said anchor by said displacement and said push-out of said cam portion, said engaging portion being adapted to be engaged with the engaging pawl of said anchor by a load of a predetermined value or more applied to said anchor through the webbing, and

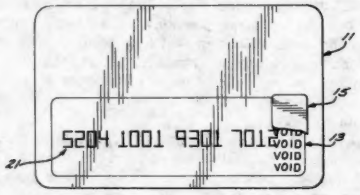
wherein said latch member is an arm held on a shaft and swingable between a position close to said driving member and a position spaced apart from said driving member, said latch member is normally biased toward said driving member, said arm has said engaging portion at the fore end thereof and a cam portion at a portion thereof op-

posed to said driving member, said guide rail has an internal path extending in the lengthwise direction thereof and parallel to the track for said anchor, said driving member is a tape having one end thereof inserted into the internal path of said guide rail and the other end thereof coupled to a motor and is slid in said guide rail by the drive of said motor, said anchor has its webbing fixing portion protruding from the track for said anchor through a hole provided near said one end of said tape, and the engaging pawl thereof is projectedly provided on the side on which said latch member is disposed.

4,573,710
SNOW SCRAPER FOR SKI BOOTS
Ronald R. Ford, 312 Laurent St., Santa Cruz, Calif. 95060
Filed Nov. 10, 1980, Ser. No. 205,101
Int. Cl.[4] A63C *11/22*
U.S. Cl. 280—813 **3 Claims**

1. A scraper adapted to be mounted on a ski pole comprising a body portion having a central passage therethrough adapted to receive the pole, and a plurality of blades projecting outwardly from said body portion, each blade extending longitudinally along and about said body portion in a spiral configuration.

4,573,711
SECURE CREDIT CARD AND METHOD OF MANUFACTURING SAME
Kirk R. Hyde, Palos Verdes Estates, Calif., assignor to Kirkplastic Company Incorporated, Los Angeles, Calif.
Filed Feb. 21, 1984, Ser. No. 581,725
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—98 **5 Claims**



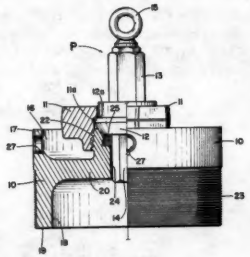
1. A secure credit card comprising: a preformed card blank including a face having an operative space formed with coded information indicative of the person or persons authorized to make transactions on the account identified by said card, and a security area of a predetermined configuration;

discernable security indicia preprinted within the confines of said security area indicating that use of said card blank is unauthorized;

a preformed security cover of holographic material formed to said predetermined configuration and overlying said security area for totally obscuring said security indicia; and

an adhesive sandwiched between said cover and card for securing said cover to said card whereby said card blank may be fabricated separate from said cover and said cover adhered thereto to cover said indicia as a last step of manufacture to cover said indicia.

4,573,712
REDUCER COUPLING AND POSITIONER TOOL FOR THE COUPLING
Donald C. Cameron, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jan. 7, 1983, Ser. No. 456,632
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—12 **2 Claims**



1. In combination, a reducer coupling for connecting a conduit section of one size to a conduit section of a different size, a positioner tool, and means for securing the positioner tool to the reducer coupling, the combination comprises:

the reducer coupling is generally defined by a one-piece coupler body;

a first cavity is defined in one end of the coupler body, and a second cavity is defined in the opposite end of the coupler body;

a bridge portion is defined within the coupler body between the first and second cavities;

the coupler body includes an upstanding hub, the hub is integral with the bridge portion, the hub extends into the first cavity, and the hub includes fastener means on the outside of the hub;

the coupler body includes a central opening therein; the opening extends lengthwise through the bridge portion and the hub;

the coupler body includes a first upstanding rim, which defines the periphery of the first cavity, and a second upstanding rim, which defines the periphery of the second cavity;

the coupler body includes fastener means on the outside of the coupler body adjacent to the second cavity; and

the positioner tool is generally defined by an elongate pin having a shoulder thereon;

the shoulder generally divides the pin into a hanger section, and a spindle section;

the central opening of the coupler body is adapted to receive the spindle section;

the securing means engages the fastener means on the hub and seats against the shoulder on the positioner tool, to thereby secure the positioner tool to the reducer coupling.

the hanger section of the positioner tool is adapted for hooking into a means for moving the reducer coupling into a desired position; and

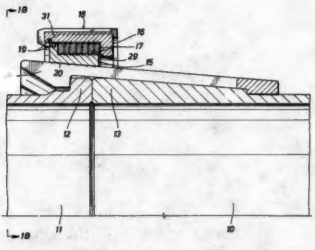
the hanger section of the positioner tool is adapted for engagement with a tool capable of rotating the reducer coupling.

4,573,713

BELLE-LOCK GRIP DEVICE

Robert M. Kipp, and Ray R. Ayers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1982, Ser. No. 443,367
Int. Cl.[3] F16L 37/12
U.S. Cl. 285—319 10 Claims



1. A gripping mechanism comprising:

multiple conical rings encircling an inner barrel, each ring having a parallelogram cross-section;

an outer barrel encircling the multiple conical rings;

a tip extending outwardly from an edge of the parallelogram cross-section of each conical ring, the tip being adjacent to the inner barrel and being on the same respective edge of each conical ring;

a series of spaced-apart ridges within the outer barrel, each ridge engaging an edge of a conical ring which is diagonally across from the tip of the conical ring; and

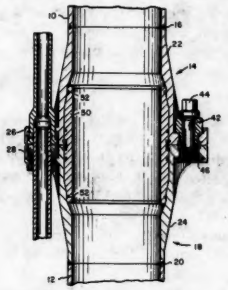
means to axially and oppositely slide the inner and outer barrels relative to each other, which movement is functionable to twist the multiple conical rings which in turn are functionable to press the tips of the rings against the inner barrel.

4,573,714

MARINE RISER COUPLING ASSEMBLY

Thomas F. Sweeney, Ventura, Calif., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Apr. 26, 1983, Ser. No. 488,835
Int. Cl.[4] F16L 23/02
U.S. Cl. 285—363 1 Claim



1. A marine riser coupling assembly, adopted to withstand high tension and cyclical bending loads comprising:

a first coupling having a tubular portion welded to a riser pipe section, and a flange portion integral with the tubular portion;

a second coupling having a tubular portion welded to a riser pipe section, and a flange portion integral with the tubular portion;

each of the flanged portions having on the face thereof, a raised face around the entire inner circumference, a raised face around substantially the entire outer circumference, and a recess around the entire circumference between the raised faces;

each flanged portion having a plurality of bolt holes through the area of the recess and alignable with each other;

a plurality of bolts through said bolt holes securing the flange portions to one another with both the inner and outer faces in highly loaded contact;

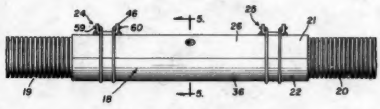
an external fillet connecting the inboard side of the flanged portion and the outer surface of the tubular portion, the fillet extending from the location outboard of the center line of the bolt holes with the dimension along the tubular portion being significantly greater than the dimension across the flange; and flat surfaces machined through said fillet at the location of said bolt holes.

4,573,715

TEMPORARY DUCT LINER INTERCONNECT DEVICE

George E. Armbruster, Park Ridge, Ill., assignor to Illinois Bell Telephone Company, Chicago, Ill.

Filed Nov. 9, 1984, Ser. No. 669,759
Int. Cl.[4] F16L 17/00
U.S. Cl. 285—94 9 Claims



7. A duct liner interconnect device for temporarily interconnecting axially aligned ends of two duct liner sections in a spaced apart relation while cables are being pulled into and through the duct liner, said duct liner interconnect device comprising a first semi-cylindrical element, a second semi-cylindrical element, hinge means, and latching means, said first and second elements being complementary in shape and each having a convex outer surface and a concave inner surface, said hinge means interconnecting said first and second elements along first longitudinal edges thereof, said first and second elements being foldable about said hinge means from an open position in which said first and second elements are disposed side by side toward a closed position in which said first and second elements form a short tubular member with said concave inner surfaces defining a longitudinal channel to receive the ends of the duct liner sections, said latching means including first and second latch assemblies each including a spring clip and a mounting member, each spring clip having a fixed end, a free end, and an arcuate generally semicircular portion interconnecting said fixed and free ends, said semicircular portion including first and second parallel extending rod members joined together at one end, defining said free end of said spring clip, and having respective first and second rod ends bent over to define first and second pivot pins at said fixed end of said spring clip, each mounting member being U-shaped having a base portion and first and second apertured ear portions, said base portion being attached to said outer surface of said first element with said apertured ear portions projecting outwardly therefrom with said first and second pivot pins being received thereby, defining a pivot axis for said spring clip, enabling said spring clip to be pivoted to a latch position, in which the arcuate portion of said spring clip is flexed causing its free end to be maintained in frictional engagement with said curved outer surface of said second element at a location substantially diametrically opposed to the pivot axis thereby maintaining said spring clip in its latch position releasably latching said first and second elements together in their closed position, said first and second elements each having a circumferentially extending shoulder portion on its concave inner surface which defines first and second stop surfaces which are

engaged by the ends of the duct liner sections to maintain them in a spaced relationship defining a space therebetween, and said first element having first and second tapped apertures extending through said first element from its outer surface to its inner surface and said shoulder portion thereof communicating the space with the exterior, said first aperture being adapted to receive a lubrication fitting to permit the introduction of lubricant into the space between the ends of the duct liner sections for lubricating the cables as they are pulled through the duct liner, and said second aperture providing an air outlet for exhausting air from the space as lubricant is introduced into the space through said first aperture.

4,573,716

TUBE COUPLINGS

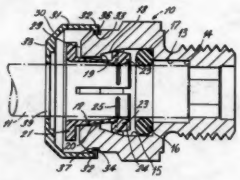
John D. Guest, "Iona", Cannon Hill Way, Bray, Maidenhead, Berkshire, United Kingdom

Filed Dec. 8, 1983, Ser. No. 559,507

Claims priority, application United Kingdom, Dec. 13, 1982, 8235475

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—323 **10 Claims**



1. A tube coupling comprising a collet to receive a tube to be held therein;

a body part having an end from which a bore extends through the body part, the bore having an axially tapered portion to cooperate with arms of said collet extending into the bore, the tapered portion of the bore being such that movement of the collet arms engaging the tapered portion axially outwardly of the bore causes the collet arms to be pressed inwardly to grip a tube in the collet;

a resilient end cover enclosing said end of the body and part of the collet projecting from said end of the bore and adapted to engage resiliently a part of the coupling body;

an apertured portion in the end cover through which a tube can extend into the collet;

abutment means on the body part facing towards said end of the body part into which the bore extends and with which the end cover is engageable to hold said apertured portion of the end cover spaced apart from the axially outer end of the collet such that accidental impact on the cover is absorbed by the cover and is not transmitted to the collet to avoid accidental relase of the tube;

wherein the end cover and coupling body are shaped so that the end cover can be disengaged from the body by an axially outward pull to reveal the end of the collet when it is required to release the collet.

4,573,717

TOGGLE CLAMP

Roy N. Peacock, Lafayette, Colo., assignor to HPS Corporation, Boulder, Colo.

Filed Jul. 9, 1984, Ser. No. 628,849

Int. Cl.[4] F16L *23/00*

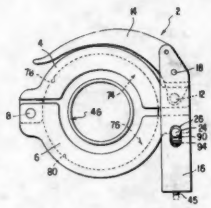
U.S. Cl. 285—365 **11 Claims**

1. A toggle clamp comprising:

first and second clamping means pivotally connected together for receiving objects to be clamped therebetween;

a handle pivotally mounted with respect to one of said clamping means;

a bail including a force generating means where the bail is so mounted with respect to the handle that upon movement of the handle from a first position to a second position, the force generating means is moved to a first position to generate a force for clamping the objects together with a first clamping force; and



means, upon weakening or failure of the force generating means, for permitting movement of the force generating means to a second position where the objects remain clamped together with a force less than that of the first clamping force

whereby a fail-safe operation is provided.

4,573,718

FLY TYING COMBINATION TOOL

Robert N. G. Stiver, Box 166, R.D. 2, Mill Hall, Pa. 17751

Filed Jun. 12, 1984, Ser. No. 619,927

Int. Cl.[4] D03J *3/00*

U.S. Cl. 289—17 **10 Claims**

1. A tool for tying a fly comprising, in combination, an elongated member comprising a plurality of telescoping parts which can be extended and collapsed; said plurality of telescoping parts comprising: (a) a first member having a clasp means at one end and terminating in a point extending away from said clasp means; (b) a second member suitable for tying knots and slidingly engaged over said first member; (c) a third member suitable for tying knots and slidingly engaged over said second member; (d) a fourth member terminating in a needle-like point at one end and a hook means extending away from said point, said hook means adapted for fur and hair spinning, whereby said telescoping parts may be used in combination or separately.

4,573,719

KNOT TYING APPARATUS

Donald J. Aldridge, Rte. #1, Box 172L, Peshtigo, Wis. 54157

Filed Feb. 4, 1985, Ser. No. 698,120

Int. Cl.[4] D03J *3/00*

U.S. Cl. 289—17 **10 Claims**

1. A portable apparatus for wrapping a free end of a line about a source line for the purpose of forming a knot and comprising;

(a) a base having a top and bottom surface and the bottom surface is detachably securable to a stable surface by a securement means,

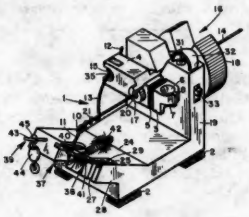
(b) an attachment holding member projecting upward from the top surface of the base and having as a part thereof at least one attachment holding means,

(c) a shaft support member projecting upward from the top surface of the base and spaced apart from the attachment holding member,

(d) a shaft having an axial bore directed towards the attachment holding member and rotatably mounted in the shaft

support member and the shaft has a winding arm projecting radial from and mounted to the shaft at a location near the end of the shaft and positioned between the attachment holding member and the shaft support member and a turning knob is secured to the shaft, and the shaft, the knob, and the arm define a longitudinal slot which communicates from the axial bore of the shaft to the outside of the shaft, knob, and arm so that when the slot is aligned with a mating slot in the shaft support a line may be passed through the slots into the axial bore of the shaft, and

(e) a line holding means attached to the winding arm at a location near the end of the arm most distant from the shaft.



4,573,720

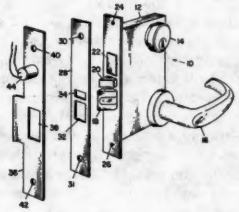
FAILSAFE SECURITY LOCK

J. Steven Nicolai, 8754 Oak Park Ave., Northridge, Calif. 91325

Filed Sep. 1, 1983, Ser. No. 528,457

Int. Cl.[4] E05C *13/10*

U.S. Cl. 292—144 **15 Claims**



1. A safety door lock for a door comprising an electromagnetic lock, a magnetic switch located opposite an internal magnet mounted in a lock housing, the magnetic switch and internal magnet forming a closed circuit with the electromagnetic lock, means located in the lock housing to retract the internal magnet from the magnetic switch in order to break the close circuit.

4,573,721

SECURITY LOCK

Melvin C. Orchard, and Michael Rogers, both of Salt Lake City, Utah, assignors to The Joint Lock Corporation, Salt Lake City, Utah

Filed Apr. 16, 1984, Ser. No. 600,889

Int. Cl.[4] E05C *1/04*

U.S. Cl. 292—145 **4 Claims**

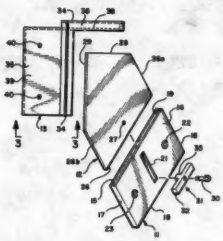
1. A security locking mechanism for securing the upper swinging edge corner of a door to the adjacent door jamb corner comprising in combination:

(a) a generally rectangular housing adapted to be attached to the inside surface of said door corner and having parallel upper and lower flat surfaces, said surfaces being separated by interconnecting parallel sidewalls and a rear endwall and having an open front end, said upper surface containing an open elongated slot parallel to said sidewalls through which a latch handle may be inserted;

(b) a flat latch slidably engaged in said housing through said open front end between said upper and lower surfaces, said flat latch having a trailing edge, parallel side edges at right angles to said trailing edge and converging leading edges depending forwardly and inwardly from said side edges and joining at right angles at a forward apex;

(c) a latch handle inserted through the open elongated slot in said upper surface of said housing and secured to said flat latch to allow said latch to be slid within said housing along the length of said open elongated slot; and

(d) a receiver mountable to said door jamb corner consisting of contiguous flat flange sections depending from each other at right angles which, when mounted in said door jamb corner will have surfaces normal to the inner surface of said door, said flange sections containing apertures through which attachment means may be inserted to secure said flanges to the door jamb, said flange sections containing a forward edge and a rear edge, an elongated channel contiguous with and extending around the forward edge of said flange sections, said elongated channel extending backwardly from said flange sections so as to be toward said door jamb corner when mounted and opening forwardly at right angles so as to be toward said door corner when mounted, said elongated channel being adapted to receive said converging leading edges of said flat latch when said flat latch is moved forwardly through said housing by means of said latch handle.



4,573,722

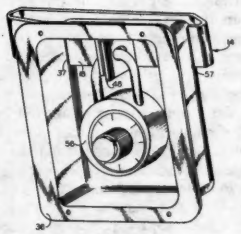
LOCKER HANDLE ASSEMBLY

William E. Lyng, Main St., Truthville, N.Y. 12854

Continuation of Ser. No. 542,001, Oct. 14, 1983, abandoned. This application Oct. 25, 1984, Ser. No. 664,615

Int. Cl.[4] E05C *1/04*

U.S. Cl. 292—148 **10 Claims**



1. A locker handle assembly comprising:

a recessed mounting receptacle having a rear wall, outwardly extending side walls, an open front portion, and a flange extending from said side walls at the open front portion;

two longitudinally extending slots, one each located along each of two opposite sides of the receptacle; and

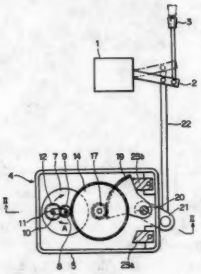
a slide bolt having front and back bars held together at opposite ends and in a spaced-apart relationship such that the front bar passes through the longitudinally extending slots in front of the rear wall and the back bar passes behind the rear wall, the slide bolt being horizontally reciprocally operable between a latched and unlatched position such that a predetermined portion of the slide bolt moves in a reciprocal fashion behind a locker door frame.

4,573,723

SYSTEM INCLUDING BI-DIRECTIONAL DRIVE MECHANISM

Yoshiyuki Morita, Kariya, and Hiroshi Nakamura, Nishio, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 10, 1984, Ser. No. 639,430
Claims priority, application Japan, Nov. 26, 1983, 58-222854
Int. Cl.[4] E05B *3/00, 47/00;* F16H *3/34*
U.S. Cl. 292—336.3 7 Claims



7. A driving apparatus for an automotive equipment comprising:

a housing (**4, 5**);

a reversible electric motor (**7**) housed in and supported by said housing;

sun gear means (**9**) fixed to an output shaft (**8**) of said electric motor;

swing lever means (**10**) rotatably supported by said output shaft at its one end;

planetary gear means (**12**) rotatably supported by said swing lever means at its other end, said planetary gear means being rotatable around its own axis and engaged with said sun gear means;

resistive element means (**13**) provided between said swing lever means and one of said sun gear means and said planetary gear means for applying a frictional force to said one of said sun gear means and said planetary gear means, so that when said output shaft is rotated, said planetary gear means rotates around said output shaft;

driven gear means (**14, 80**) rotatably supported by said housing and arranged on the same plane as said planetary gear means at such a position where said driven gear means is out of engagement with said sun gear means but can be brought into and out of engagement with said planetary gear means when said planetary gear means is rotated around said output shaft by said electric motor;

a driven shaft (**16, 81**) rotatably supported by said housing and coaxially arranged with said driven gear means; and

elastic element means (**15, 84**) provided between said driven gear means and said driven shaft for storing a restoring energy, so that a rotational force is transmitted to said driven shaft when a predetermined amount of said restoring energy is stored in said elastic element means,

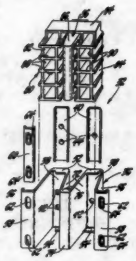
whereby when said electric motor is rotated in one directions, said planetary gear means is rotated around said output shaft until said planetary gear means is brought into engagement with said driven gear means, when said planetary gear means and driven gear means are engaged with each other, said driven gear means is rotated in one direction to at first store said restoring energy and then rotate said driven shaft, and when the rotation of said electric motor is stopped, said driven gear means is rotated in the opposite direction by said restoring energy to bring said planetary gear means out of engagement with said driven gear means.

4,573,724

HARDBAR ENERGY ABSORBING AND VIBRATION DAMPING BUMPER SYSTEM DAMPING FEATURE

Lawrence E. Campen, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1983, Ser. No. 555,502
Int. Cl.[4] B60R *19/30;* F16F *7/00*
U.S. Cl. 293—136 5 Claims



3. A resilient one-piece energy absorbing grid of plastic material for use in dissipating energy in a vehicle bumper system, said grid comprising first, second and third grid sections disposed adjacent to each other, each of said grid sections having a plurality of longitudinally extending cells extending in a first axial direction and having common walls therebetween, first live hinge means interconnecting said first and second grid sections at a predetermined spacing from each other and forming a connection therebetween, a third of said grid sections being connected intermediate of said first and second sections and to said first live hinge means by second live hinge means so that said third section can be turned on a vertical axis to orient the cells of said third section in a direction generally transverse to said first axial direction and whereby the first live hinge means permits said first and second sections to be subsequently positioned to the sides of said third section.

4,573,725

REMOTE CONTROLLED CRANE HOOK COUPLER

Edward E. Griffiths, 3200 Folaris St. #23, Las Vegas, Nev. 89102

Filed Apr. 2, 1984, Ser. No. 595,712
Int. Cl.[4] B66C *1/34, 1/66*
U.S. Cl. 294—82.28 9 Claims

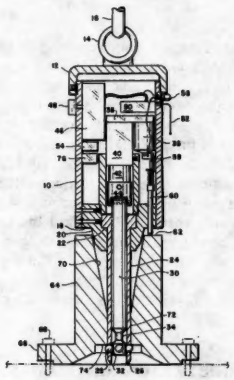
1. A coupler controllable from a remote position for interconnecting a first member of said coupler that is attachable to a lifting device to a second member of said coupler that is attachable to a load to be lifted, said coupler comprising:

the second member, said second member having a funnel shaped aperture on a substantially vertical axis, the broad end of said funnel shaped aperture being directable toward the first member of said coupler, the apex end of said funnel shaped aperture terminating in a base portion having an aperture coaxial with said funnel shaped aperture and connected therewith, said base portion having a substantially horizontal shoulder adjacent said base portion coaxial aperture and coaxial therewith;

the first member, said first member having an elongated

tubular member extending from one end thereof upon a substantially vertical axis and directable toward said funnel shaped aperture in said second member, the distal first end of said tubular member having an outer diameter adapted to pass through said funnel shaped aperture and through the aperture in the base portion of said second member, said tubular member having near said distal first end a ring of radial holes of predetermined diameter through the wall of said tubular member;

a cam shaft extending from said first member and slideably extending within the bore of said elongated tubular member to a first shaft end at the distal first end of said tubular member, said cam shaft having at said first shaft end an annular ring having a diameter substantially equal to the inside diameter of said tubular member and an annular groove adjacent said annular ring and at a position corresponding to said ring of radial holes through the wall of said tubular member;



a plurality of balls each having a diameter slightly greater than the predetermined diameter of said radial holes through the wall of said tubular member, one ball of said plurality being positioned in a corresponding one of said radial holes and in said annular groove in said cam shaft; and

engaging means including an electrically operated linear actuator in said first member for sliding said cam shaft in a first direction in the bore of said tubular member whereby said annular ring at said first shaft end will force said plurality of balls from said annular groove and partially through the radial holes through said tubular member to a position that will engage the shoulder in the base portion of said second member, said engaging means further including a switch actuated by the seating of said first member into said second member, said switch in circuit with said linear actuator for actuating said linear actuator to slide said tubular member in said first direction.

4,573,726

HOISTING APPARATUS FOR ELECTRIC SUBMERSIBLE PUMP UNITS

Albert Blum, Scheiderhöhe, 5204 Lohmar 1, Fed. Rep. of Germany

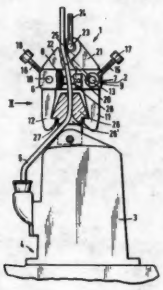
Filed Apr. 5, 1984, Ser. No. 596,946

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314051

Int. Cl.[4] B66C *23/60*

U.S. Cl. 294—86.33 **12 Claims**

1. Hoisting apparatus for electric submersible pump units, particularly for use in deep shafts, comprising a flexible traction element, a drive means for hoisting and lowering the traction element and a coupling part arranged at the lower end of the traction element, which is automatically connectable to and releasable from a corresponding connecting element provided on the submersible pump unit, characterised in that the coupling part (1; 33) arranged on the traction element exhibits



an eye (2; 37) which encloses with play the electric cable (5) passed down to the electric motor (3) of the submersible pump unit (4), and that the connecting element (26) on the submersible pump unit (4) is arranged in immediate proximity to the electric cable (5).

4,573,727

ROBOT HAND

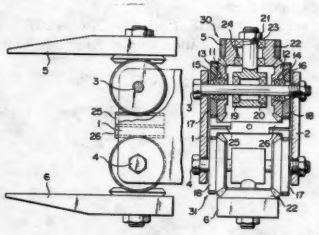
Shoichi Iikura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 20, 1984, Ser. No. 652,591

Claims priority, application Japan, Mar. 31, 1984, 59-63508

Int. Cl.[4] B25J *15/08*

U.S. Cl. 294—115 **4 Claims**



1. A robot hand comprising:

a robot hand body;

first and second parallel main shafts fixed to said robot hand body;

first and second finger member-driving mechanisms respectively provided on said first and second main shafts to face each other, each finger member-driving mechanism including first and second bevel gears separately set and rotatably supported on the main shaft, an auxiliary shaft rotatably supported on the main shaft, and a third bevel gear supported on said auxiliary shaft to be rotated about an axis perpendicularly intersecting the main shaft and meshed with both first and second bevel gears;

a finger member fixed to said third bevel gear; and

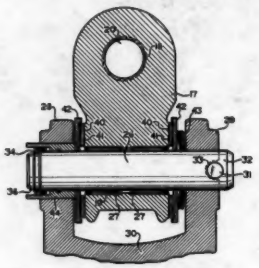
drive means for rotating said first and second bevel gears.

4,573,728

SNUBBING APPARATUS FOR GRAPPLES AND THE LIKE

Thomas E. Johnson, Woodstock, Canada, assignor to Timberjack Inc., Woodstock, Canada

Filed Jul. 19, 1984, Ser. No. 632,503
Int. Cl.[4] B66C 1/00; F16F 7/04
U.S. Cl. 294—119.4 8 Claims



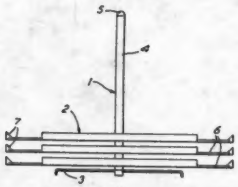
1. A snubber for a bidirectional pivot apparatus for suspending a load comprising a bidirectional pivot member for supporting a pair of pins at right angles to each other, a pin extending through said bidirectional pivot member, a yoke having spaced arms mounted on said pin, snubber brake means positioned between said member and each of said arms and means for preventing said pin from moving axially relatively to said arms, the improvement comprising an elongated cylindrical snubber piston slidably mounted on said pin to actuate said snubber brake means, bearing means mounted on said pin supporting said cylindrical piston, said piston and bearing means forming a chamber with said pin and means to pressurize said chamber with a fluid.

4,573,729

TRAYS

Leonard A. Cookson, The Continental Hotel, Jerbourg St. Martin's, Channel Islands

Filed Oct. 18, 1983, Ser. No. 546,027
Claims priority, application United Kingdom, Oct. 19, 1982, 8230523
Int. Cl.[4] B65D 71/00
U.S. Cl. 294—158 4 Claims



1. A demountable tray assembly comprising:

a plurality of superimposed trays, each tray having a centrally disposed non-circular aperture in the shape of a slot extending transversely part way across the tray; and

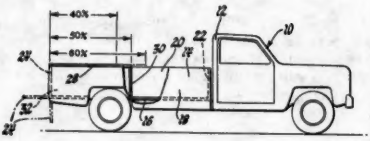
a base including upstanding supporting means and a carrying handle, said upstanding supporting means terminating in said carrying handle, the supporting means and said carrying handle being shaped and dimensioned to pass through each tray aperture to prevent any substantial movement of the trays other than at right angles to their planes, the trays being placed on the supporting means and removed therefrom over the carrying handle.

4,573,730

DRAG REDUCING PARTIAL TONNEAU FOR PICKUP TRUCK

Theodore R. Gondert, Romeo, and Richard A. MacDonald, Brighton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 16, 1984, Ser. No. 610,692
Int. Cl.[4] B62D 35/00
U.S. Cl. 296—1 S 1 Claim



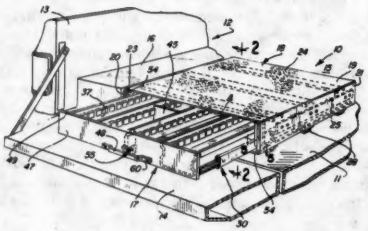
1. In an aerodynamic drag reducing device for a pickup truck having a pickup box defined by a bed, a front wall adjacent the passenger cab, spaced apart side walls, and a tailgate, said drag reducing device comprising: a tonneau cover extending between the side walls and forwardly from the tailgate to a distance short of the passenger cab, said tonneau cover cooperating with the side walls and the bed to define an open front storage compartment accessible through either the tailgate or the open front thereof, and said tonneau cover having a length to cover only the rearmost 40–60% of the total length of the pickup box, whereby the aerodynamic drag of the pickup truck is reduced to an extent greater than the drag reduction obtained by a partial tonneau cover of length greater or lesser than the rearmost 40–60% of the total length of the pickup box.

4,573,731

VEHICLE STORAGE DRAWER UNIT

Howard L. Knaack, and Kenneth F. Weger, Jr., both of Cary, Ill., assignors to Knaack Manufacturing Company, Crystal Lake, Ill.

Filed Oct. 28, 1982, Ser. No. 437,444
Int. Cl.[4] B60R 11/06; A47B 88/04, 88/20
U.S. Cl. 296—376 25 Claims



1. For use in a vehicle having a conventional bed with the space immediately above the bed being horizontally accessible at an access position, a selectively accessible self-contained storage unit providing a raised floor on said bed, said storage unit comprising:

a housing having sidewalls, a bottom wall, a top wall and a rear wall cooperatively defining a front opening drawer space, said housing being constructed to be installed on said bed to open to the access position;

a drawer complementary to and received in said drawer space; and

means for movably mounting said drawer to said sidewalls for selective movement between a closed position within

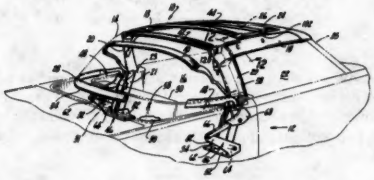
said drawer space and an open position wherein the drawer extends outwardly from the housing through said access position, said drawer comprising a plurality of U-channels having facially joined upstanding legs defining front-to-rear drawer dividers and bights defining the bottom wall of the drawer.

4,573,732

CONVERTIBLE TOP FRAME

Peter P. Muscat, 441 Highview St., Dearborn, Mich. 48128

Filed Apr. 30, 1984, Ser. No. 605,070
Int. Cl.[4] B60J 7/12
U.S. Cl. 296—108 13 Claims



1. A convertible top for the body of a motor vehicle having a passenger compartment, said top adapted to be raised to cover the passenger compartment and lowered by folding into a body space region extending behind and beside said passenger compartment, comprising:

a pair of spaced elongated pillar members, means pivotally anchoring each one of said pillar members to said body in said body space on a respective side of said passenger compartment so as to be swingable between a raised, substantially vertical position and a lowered, substantially horizontal position, said pillar members in said lowered position extending from said pivotal anchoring means towards the rear of said body;

a pair of elongate unitary side rails;

means connecting each side rail at one end to the upper end of a respective pillar member so as to extend leading ends thereof fowardly from said pillar member in said raised position;

said connecting means allowing pivoting forward of each of said side rails into said body space regions alongside said passenger compartment and over said respective attached pillar member, with each of said pillar members in said lowered position;

said connecting means establishing a pivot axis skewed with respect to the length of said body so that each of said side rails move outwardly of said body in being pivoted to extend forwardly and over said respective lowered pillar member;

a plurality of elongate bow members extending between said pair of pillar members and connected side rails, said bow members spaced apart to define a top support, and bow mounting means mounting each of said bow members to a respective one of said pillar members and connected side rails, said bow mounting means causing positioning of said plurality of bow members in said body spaced region to the rear of said passenger compartment upon movement of said pair of pillar members and connected side rails to said positions whereat said pillar members are in said lowered, horizontal position and said side rails are in said forward position in said body space regions on either side of said passenger compartment; and,

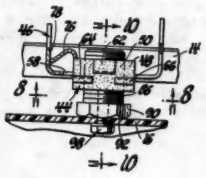
a flexible top mounted to extend across the space between said pair of pillar members and connected side rails and above said plurality of bow members, with said frame in said raised position, and folded into said body space with said frame in said lowered position.

4,573,733

APPARATUS FOR MOUNTING PLASTIC BODY PANEL

Wieslaw S. Zaydel, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 442,861, Nov. 19, 1982, Pat. No. 4,529,244.
This application Sep. 20, 1984, Ser. No. 652,225
Int. Cl.[4] B62D 27/04, 29/04; F16B 37/04
U.S. Cl. 296—191 1 Claim



1. Apparatus for movably mounting the second end of a plastic panel having a first fixed end fixed to a vehicle body metal substructure to permit the second end of the plastic panel to move longitudinally toward and away from the fixed first end upon thermal or hydroscopic dimensional change of the plastic panel comprising:

a molded plastic first mounting member having associated means slidably interengaging with the metal substructure at a point thereon underlying the plastic panel to permit longitudinal movement of the first mounting member toward and away from the fixed first end, a plastic flexure spring integral with the first mounting member and engageable with the substructure to urge the plastic first mounting member to a certain desired longitudinal sliding position relative the fixed first end of the plastic panel, a second mounting member having a mounting face adapted for abutment by the plastic panel and providing a field for the drilling of a fastener hole for attachment of the plastic panel upon the second mounting member, helical thread means acting between the second mounting member and the first mounting member to enable rotation of the second mounting member to effect adjustment of the position of the mounting face transversely relative to the metal understructure so that the plastic panel is mounted at a desired position to obtain precise surface alignment of the plastic panel whereby the first and second mounting members cooperate to support the plastic panel on the metal substructure and slide longitudinally toward and away from the fixed end of the plastic panel upon thermal and hygroscopic dimensional change of the plastic panel.

4,573,734

UNISOCKET CONSTRUCTION FOR FRONT COMPARTMENT OF A UNITIZED AUTOMOBILE BODY

Gene C. Gass, 315 N. Masterson, Virden, Ill. 62690

Filed Dec. 10, 1984, Ser. No. 679,698
Int. Cl.[4] B62D 25/08
U.S. Cl. 296—189 5 Claims

1. A unitized automobile body having a driver compartment and a front compartment, a pair of front side pillars at the forward end of the driver compartment and a transverse dash panel between the pillars separating said compartments;

a pair of removable inner side panel assemblies extending forwardly from the dash panel defining the inner side walls of the front compartment and providing front wheel housings;

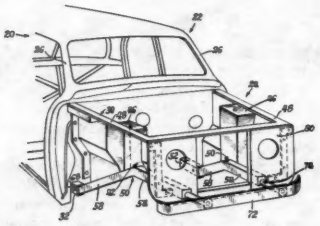
a lower socket member with a forwardly open socket fastened to the bottom of the driver compartment along each side thereof;

an upper socket member with a forwardly open socket fastened to the front pillar at each side of the driver compartment;

each inner side panel assembly including a panel formed with pockets for front wheel supporting means and headlamp means;

means for supporting and removably connecting each inner side panel assembly to the driver compartment with controlled rigidity providing sacrificial collapsibility of the front compartment in event of a head-on collision including upper and lower horizontal rails and flange means;

each lower rail being connected along the lower margin of the inner side panel assembly and having a horizontal rearwardly extending portion telescopically connectible with the respective lower socket member, a horizontal front portion being disposed at a higher level than said rearwardly extending portion and having a forwardly open socket, and a diagonal intermediate, connecting portion capable of bending under backward, collision-magnitude force transmitted through said horizontal front portion;



each upper rail being connected along the rear portion of the upper margin of the inner side panel assembly and having a horizontal rearwardly extending portion telescopically connectible with the respective upper socket member;

said flange means extending along the rear margin of the inner side panel assembly and being connectible by first fastener means to the forward face of the dash panel;

second fastener means holding said rearwardly extending portions of the lower and upper rails removably mounted within the respective socket members;

shoulder means acting between the rails and respective socket members to relieve said second fastener means of stress caused by backward thrust through the rails; a front cross panel and radiator support member connected between the front ends of the inner side panel assemblies and defining the inner front wall of the front compartment; and

energy absorbing means fitted within each of the forwardly open sockets in the front portions of the lower rails and connected to front bumper means.

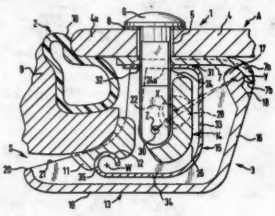
4,573,735

HINGE ASSEMBLY

Jeffery A. Frampton, Begnins, Switzerland, and Nicholas Bartman, Aylesbury, England, assignors to Idex (Jersey) Limited, Channel Islands

Filed Feb. 7, 1984, Ser. No. 577,865
Int. Cl.[4] B60J *7/18*
U.S. Cl. 296—218 **7 Claims**

1. In a motor vehicle sunroof having a panel member and a peripheral elastomeric seal upon which the edge of said panel member seats and the improvement comprising a hinge structure attached at the forward edge of said panel member, said hinge structure comprising a channel lying in a horizontal plane below said panel member and having an upper wall and a lower wall substantially parallel to said upper wall and spaced from said upper wall to define therebetween a U-shaped opening facing forwardly of said panel member, attachment means attaching said upper wall of said channel to said panel member with said lower wall of said channel extending forwardly beneath the forward portion of said elastomeric seal, a horizontally extending location strip attached to the sunroof beneath the forward portion of said elastomeric seal, said location strip having a downwardly opening groove with a substantially arcuate cross-section extending along its lower surface, and a rounded formation formed on the forward edge



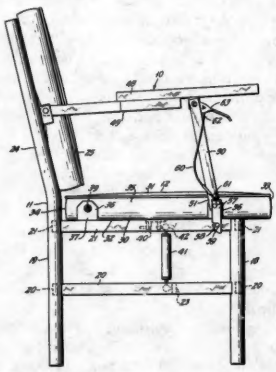
of said lower wall of said channel for location in said groove to form a pivot axis for said channel located beneath the forward edge of said elastomeric seal and forwardly of said attachment means between said upper wall of said channel and said panel member.

4,573,736

CHAIR FOR HANDICAPPED PERSONS

Nat Levenberg, 2 Windsor Pl., Lynbrook, N.Y. 11563

Continuation-in-part of Ser. No. 564,555, Dec. 22, 1983, Pat. No. 4,538,853. This application Sep. 4, 1984, Ser. No. 646,811
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—339 **2 Claims**



1. A chair construction for use by handicapped persons comprising: a relatively rigid frame element and a movable seat element; said frame element including a plurality of frame members providing a fixed horizontal platform at normal seat height and a fixed back cushion disposed in generally vertical orientation at one side of said platform; a seat bottom cushion mounted on said platform for pivotal movement on an axis parallel to an adjacent rear transverse edge thereof; a plurality of resiliently compressible members interconnecting said frame element and an under surface of said bottom cushion forwardly of said axis; a pair of arm rests each including a pivotally interconnected horizontal and vertical strut; said horizontal strut being pivotally connected at the rear end thereof to said back cushion, said vertical strut being connected at a lower end to said seat cushion forwardly of said resiliently compressible members; and such chair construction further characterized in the provision of adjustable means for shifting the points of interconnection of said resiliently compressible members along

a forward-rearward axis to vary the distance of said points relative to said first mentioned axis, and thereby vary the effective force on said bottom cushion necessary to move said bottom cushion to horizontal condition; whereby upward movement of said seat cushion results in corresponding movement of said arm rests; and locking means manually controllable from said arm rests for fixing the position against the compressive force of said resiliently comrpessible elements.

4,573,737

CHAIR WITH A HEIGHT-ADJUSTABLE BACK REST

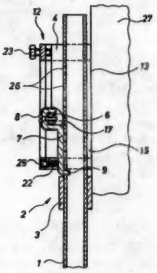
Heinrich Korn, Hindemithstrasse 23, Maintal 4, Fed. Rep. of Germany (8906)

Filed Sep. 7, 1983, Ser. No. 530,109

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233104

Int. Cl.[4] B60N *1/06*

U.S. Cl. 297—353 9 Claims



1. A chair with a height adjustable back rest, comprising:

a back rest support;

an adjusting member mounted on the back rest support and vertically movable relative thereto for supporting the back rest;

detent means for retaining the adjusting member on the back rest support, said detent means including detent holes in the back rest support, a detent pin adapted for insertion into one of the detent holes, and a compression spring against which the detent pin can be released, said detent means being arranged between the back rest support and the adjusting member;

said detent means further comprising at least one activating member;

bar means for pivotably mounting the activating member to the adjusting member; said bar means arranged horizontally through said adjusting member and formed with an upwardly bent end;

said detent means further comprising a detent member connected with the bar means so as to rotate therewith, said detent pin arranged on the detent member so as to cooperate with one of the detent holes in the back rest support;

wherein the back rest is mounted so as to be pivotable about the bar means and in that the compression spring is tensed between the detent member and one of a mounting body and a chair element which is rigidly connected with one of the adjusting member and the back rest, respectively.

4,573,738

MANUAL SEAT RECLINER

Max O. Heesch, Ypsilanti, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,957

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—362 12 Claims

1. A seat recliner comprising

a seat back support,

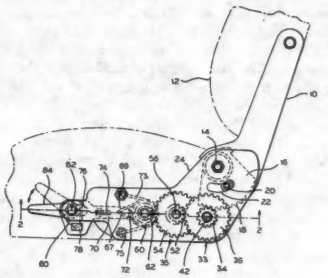
a sector gear affixed to said seat back support,

a base frame including an inner plate and an outer plate joined by spacer elements located between said inner plate and said outer plate to form a space therebetween,

a pivot means at which said seat back support and said sector gear are pivotally joined to said base frame,

a first gear set mounted on a pin set between said inner plate and said outer plate of said base frame, said first gear set having a first toothed wheel meshed with teeth on said sector gear and a second toothed wheel,

a second gear set mounted on a pin set between said inner plate and said outer plate of said base frame, said second gear set having a first toothed wheel meshed with the second toothed wheel of said first gear set and a second toothed wheel,



a clutch spool mounted on a pin set between said inner plate and said outer plate of said base frame, said clutch spool having a toothed wheel meshed with the second toothed wheel of said second gear set, a spring coil means around said clutch spool such that when tensioned, said spring coil means prevents said clutch spool from rotating and thusly locks the seat back support in a selected position,

and a clutch release plate mounted on a shaft set between said inner plate and said outer plate of said base frame, said clutch release plate contacts said spring coil means in a manner such that upon a selected movement of said clutch release plate, the tension of said spring coil means is decreased to permit rotation of said clutch spool to thereby permit the movement of said seat back support.

4,573,739

HINGE STRUCTURE FOR SEAT WITH ADJUSTABLE BACKREST

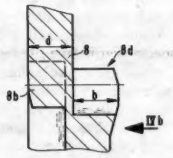
Willi Schöttker, Nordsehl, Fed. Rep. of Germany, assignor to P. A. Rentrop, Hubbert & Wagner Fahrzeugausstatungen GmbH & Co. KG, Stadthagen, Fed. Rep. of Germany

Filed Nov. 16, 1983, Ser. No. 552,560

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244399

Int. Cl.[4] A47C *1/024;* B21K *1/30*

U.S. Cl. 297—362 2 Claims



1. An improved hinge structure for use with seats having a

stationary seat portion and a pivotable backrest, said hinge structure comprising:

a first hinge piece made from a starting material of a given initial thickness, said first hinge piece having a first outwardly projecting spur gear tooth system protruding from one side thereof and a first inwardly projecting tooth system indented on the other side thereof, said first tooth systems being concentric and the diameter of said protruding tooth system being smaller than that of said indented tooth system, and tooth contour of said protruding tooth being smaller over a portion thereof than that of a corresponding portion of said indented tooth system, wherein the effective width of the teeth of said protruding system is greater than said initial thickness; said first hinge piece also having a first central hole concentric with said first tooth systems;

a second hinge piece made from a starting material of a given initial thickness, said second hinge piece having a second outwardly projecting spur gear tooth system protruding from one side thereof and a second inwardly projecting tooth system indented on the other side thereof said second tooth systems being concentric and the diameter of said protruding tooth system being smaller than that of said second indented tooth system and tooth contour of said protruding tooth being smaller over a portion thereof than that of a corresponding portion of said second indented tooth system, wherein the effective width of the tooth of said indented system is greater than said initial thickness; said second hinge piece also having a second central hole concentric with said second tooth systems; and

a pivot axle having an eccentric portion, said axle pivotably joining said hinge pieces with said first protruding tooth system extending into said second indented tooth system and with said eccentric portion rotatably extending into one of said first and second holes, whereby rotation of said pivot axle causes relative movement between said first protruding tooth system and said second indented tooth system.

4,573,740

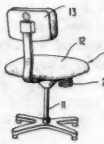
UPHOLSTERED SEAT FOR CLEAN ROOM

James W. Frobose, Haskins, Ohio, assignor to The Jasper Corporation, Easton, Md.

Continuation-in-part of Ser. No. 551,914, Nov. 15, 1983, and Ser. No. 551,913, Nov. 15, 1983. This application Jun. 18, 1984, Ser. No. 621,714

Int. Cl.⁴ A47C *7/18*

U.S. Cl. 297—452 **5 Claims**



1. In upholstered furniture for industrial clean rooms, a body support portion comprising a substantially rigid panel member, a yielding cushion on and substantially covering a top face of said panel member, an air impermeable sheet material cover for said body support portion surrounding and enclosing said panel member and cushion and being in hermetically sealed relationship to said panel member, said panel member and cover having substantially registering openings formed therethrough, and an expandable and collapsible air impermeable vessel located on the bottom face of said panel member and secured to the body support portion on the exterior of said cover, said vessel having its interior in communication with the body support portion through said registering openings and being in hermetically sealed relationship with the panel member and said cover, whereby air can enter and leave said body support portion by passing into and out of said vessel to thereby prevent the escape of air and particles internal of the body support portion into the air external of the body support portion.

4,573,741

FURNITURE STRUCTURAL COMPONENT

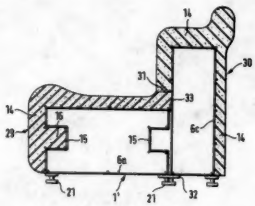
Angelika Kirchner-Carl, Waldstrasse 16, D-8644 Pressig, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,969

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240783

Int. Cl.⁴ A97C *7/02*

U.S. Cl. 297—452 **28 Claims**



1. A structural component forming an interior part of a piece of upholstered furniture comprising a plurality of longitudinal and transverse metal rods interconnected at essentially right angles to form a self-supporting grid-like envelope having a hollow interior and a shrunken plastic foil covering and adhered to at least the outer surfaces of the grid envelope.

4,573,742

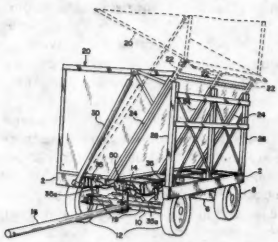
HYDRAULIC STABILIZING MECHANISM FOR USE WITH HYDRAULIC ELEVATING SYSTEM

Sheldon D. Tegtmeier, West Fargo, N. Dak., assignor to Tegtmeier & Sons, Inc., West Fargo, N. Dak.

Filed Nov. 7, 1983, Ser. No. 549,275

Int. Cl.⁴ B65G *67/32*

U.S. Cl. 298—11 **4 Claims**



1. A stabilizing hydraulic system for use in a farm wagon box dumping mechanism in conjunction with a main hydraulic box dumping system of the type having at least a pair of main hydraulic dumping cylinders responsive for actuation in two directions to a valve-controlled hydraulic pump and reservoir system which produces a normal operating pressure during extension and retraction of the main hydraulic cylinders, but which produces substantially increased pressure after the main dumping cylinders reach fully retracted position, said stabilizing system comprising,

a wheeled wagon,

a dump box pivotally mounted on one side thereof and including a rigid frame mounted on said wheels with a front axle underlying the front of said frame and mounted for transverse pivotal action substantially on the longitudinal center line of said frame,

a pair of hydraulic stabilizing cylinders interposed between the end portions of the axle and the overlying front portions of said frame, each cylinder having an extensible piston rod working therein and respectively interposed between the frame of the wagon and the outer underlying portions of the front axle whereby the piston rods when extended, will provide a pair of rigid compression struts between the frame and the underlying portions of the front axle for stabilizing the wagon during the dumping operation of the box,

a hydraulic pump supplying fluid under pressure to the main dumping cylinder and the stabilizing cylinders,

hydraulic fluid conduits carrying fluid to and from said pump and said main hydraulic cylinders and said hydraulic stabilizing cylinders,

a control valve connected to said conduits for controlling the direction of flow from said pump to said main cylinders and said stabilizing cylinders,

a pair of releaseable stabilizing check valve elements respectively interposed in the supply conduits to said hydraulic stabilizing cylinders with means for holding the same in closed position during normal retracting pressures in said hydraulic system but individually and separately responsive for release to increased pressures produced by said pump when the main cylinder has been returned to fully retracted position to permit the stabilizing cylinders to be individually and separately extended and retracted.

4,573,743

BUCKETWHEEL EXCAVATOR WITH OSCILLATING NOZZLES

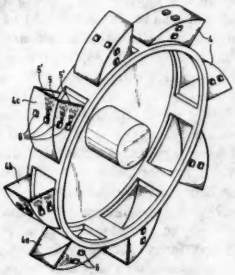
Hartmut Grathoff, Wendelstein, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg, Nuremberg, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,543

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346306

Int. Cl.[4] E21C *25/60*

U.S. Cl. 299—39 **11 Claims**



1. A bucketwheel excavator for use in open-pit mining for the loosening and removal of material of great hardness and great strength or of highly abrasive material, e.g. sandstone, bituminous coal, tar sand, oil shale and the like, comprising:

a bucketwheel rotatable about a horizontal axis, having buckets provided with bucket backs and outer side walls and transverse and lateral cutting edges; and

a nozzle system, liquid being dischargeable under high pressure from orifices of nozzles for cutting seams into the material to be mined, said nozzle system including oscillating nozzles which can be oscillated back and forth each in a plane about an axis disposed at right angles to a particular bucket cutting edge, said oscillating nozzles being disposed on the outside of said bucket backs and on said side walls of said buckets, said oscillating nozzles being disposed in a clearance angle space, the clearance angle space in the case of oscillating nozzles provided on the side of said transverse cutting edges being the space between the bucketwheel cutting circle and said bucket backs, and in the case of oscillating nozzles provided on the side of said lateral cutting edges, the clearance angle space being between said outer side walls and the surface that is engaged by a lateral cutting edge and is formed from the vectors resulting from the bucketwheel circumferential speed and the bucketwheel boom slewing speed, and said oscillating nozzles being set back from the associated cutting edge to such an extent that the liquid jets emerging from their orifices sweep the entire length of the associated cutting edge a short distance in front of it.

4,573,744

PICK AND THE COMBINATION OF A PICK AND HOLDER

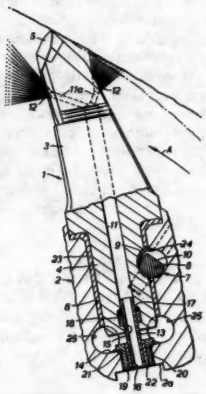
Raymond J. Clemmow, Dronfield Woodhouse; Leonard Radford, Meersbrook, and John D. Thorpe, Sheffield, all of England, assignors to Padley & Venables Limited, Dronfield, England

Continuation of Ser. No. 322,451, Nov. 18, 1981, Pat. No. 4,488,758. This application Dec. 7, 1984, Ser. No. 679,249

Claims priority, application United Kingdom, Nov. 24, 1980, 8037567

Int. Cl.[4] E21B *10/18*; E21C *7/08*; E21F *5/02*

U.S. Cl. 299—81 **14 Claims**



1. A mineral mining pick for removable placement in a socket of a holder, said holder including a tubular spigot in communication with a fluid source and axially projecting in said socket, said pick comprising:

(a) an elongated body having a head at one end thereof for receiving a cutting element and a shank having a base at the other end thereof, said body including a fluid passage extending between an outlet port in said head and an inlet port in said base, said fluid passage and said inlet port being coaxial and disposed for telescopically receiving said spigot;

(b) a flexible, annular seal having a cylindrical bore coaxially located in said fluid passage for sealingly engaging said spigot between the telescopically-received projecting end thereof and said base, said bore being sized to permit axial and radial movement of said spigot while substantially preventing axial passage of fluid between said seal and said spigot; and

(c) recess means communicating with said fluid passage

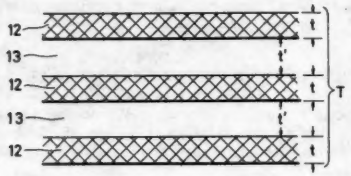
proximate said base for receiving said seal and for substantially preventing axial movement of said seal.

4,573,745

CARBON FIBER REINFORCED PLASTIC SPOKE PLATE

Masaru Fujisaki, Tokyo; Tetsuo Tsuchida, Saitama; Yoichi Sasajima, Osaka; Hiroshisa Ito, Osaka, and Masahiro Morita, Osaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Sumitomo Electric Industries, Ltd., both of, Japan

Filed Dec. 28, 1982, Ser. No. 453,864
Claims priority, application Japan, Jan. 7, 1982, 57-1658
Int. Cl.[4] B60B *5/02;* B32B *5/12*
U.S. Cl. 301—63 PW 2 Claims



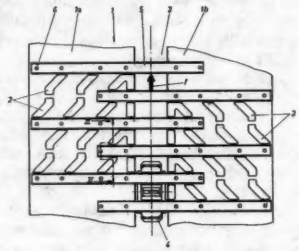
1. A spoke plate for a vehicle, said spoke plate being of the type for connecting a hub with a surrounding rim and having a first plate portion for connection to said hub, at least one second plate portion for connection to said rim and a third portion extending in a longitudinal direction between said first and second portions and integrally formed with said first and second plate portions, said spoke plate being made of a carbon fiber reinforced plastic material comprising an odd number of first carbon fiber layers each including fibers extending in said longitudinal direction as well as fibers extending in a second direction, and an even number of second carbon fiber layers arranged alternatively with said first layers and each having fibers extending only in said longitudinal direction, whereby the strength and modulus of elasticity in the longitudinal direction of said spoke plate is larger than the strength and modulus of elasticity in a lateral direction of said spoke plate.

4,573,746

TRACK FOR MOTOR VEHICLE HAVING TWO PARALLEL HALF-TRACKS

Erich Prinoth, Via Purger 181, 39046 Ortisei, Italy

Filed Jul. 1, 1983, Ser. No. 510,232
Claims priority, application Italy, Sep. 16, 1982, 23311 A/82
Int. Cl.[4] B62D *55/24*
U.S. Cl. 305—35 EB 10 Claims



1. An elongated track for a motor vehicle, comprising:

first and second spaced track segments, said segments being comprised of an elastic material, said segments forming two elongated parallel bands extending longitudinally of the track, each of said segments having inner and outer edges;

ribs projecting outwardly from each of said track segments, said ribs being formed of an elastic material, said ribs being aligned in rows transverse to the longitudinal direction of the track; and

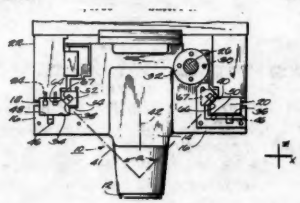
first and second connecting sections extending between and connected to said first and second track segments, said connecting sections having a continuous U-shaped cross-section, heights of said ribs exceeding heights of said connecting sections, said first connecting sections extending from the outer edge of said first track segment to and terminating at locations on the second track segment between said inner and outer edges thereof, said second connecting sections extending from the outer edge of said second track segment and terminating at locations on said first track segment between said inner and outer edges thereof, said first connecting sections alternating with said second connecting sections longitudinally along said track segments, one row of said ribs extending between adjacent ones of said connecting sections.

4,573,747

APPARATUS FOR ALIGNING A MACHINE TOOL SADDLE

Rivan F. Frazee, Mt. Clemens, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Oct. 1, 1984, Ser. No. 656,319
Int. Cl.[4] F16C *29/00*
U.S. Cl. 308—3 A 6 Claims



1. Apparatus for aligning a machine tool saddle (16) for movement along an axis of travel, said apparatus comprising:

a pair of parallel ways (18, 20) mounted to a support structure (22) in parallel relation with said axis of travel, said ways (18, 20) having faces (38, 40) which are selectively angled to lie in planes which form a "V"-shaped configuration (41) positioned to be bisected by a plane (42) located midway between said ways (18, 20), said ways being formed to slidably engage slots (34, 36) formed in said saddle (16) having bases which are parallel to a first axis and sides which are parallel to a second axis, said first and second axes being orthogonal to each other and to said axis of travel, said ways having surfaces in opposing relationship with said bases and said sides of said slots (34, 36), said angled way faces (38, 40) lying outside of said slots and at acute angles to said first and second axes;

a number of keeper blocks (52, 58), each of said keeper blocks having an angled keeper face (66) in opposing parallel relation with one of said way faces (38, 40) and first (68) and second (70) faces abutting said saddle, each of said first faces (68) being parallel to said first axis and each of said second faces (70) being parallel to said second axis; and

means (67) positioned relative to said keeper blocks (52, 58) for solidly transmitting forces between said ways (18, 20) and said saddle (16) through said angled way faces (38, 40) and said angled keeper faces (66) to maintain said saddle (16) in alignment along said axis of travel as said saddle (16) is selectively moved and positioned along said axis of travel.

4,573,748

CONTAINER FOR A ROTATING TRANSPARENCY PROJECTOR FIXABLE AT A SELECTED HEIGHT ON A VERTICAL GUIDE

Giuseppe Biraghi, V.le Ghisallo 16; Amedeo Clavarino, Via Brera 17; Ferdinando Roth, P.za Coriolano 9, and Michele Tarquini, V.Zamagna 19, all of Milan, Italy

Filed Aug. 8, 1983, Ser. No. 521,416

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—7.2 **10 Claims**

1. A container system for a projector comprising:

a vertical guide having a vertically extending track;

at least one lug connected to said guide for securing said guide to a vertical wall;

a slide slidably engaged to said track for vertical displacement with respect to said guide;

a bracket connected to said slide;

a container for containing a projector having a central vertical axis and having a first portion fixed to said bracket and including a lower hemispherical part and an upper cylindrical part, said container including a hemispherical top part disengageably connected to said cylindrical part for opening a top of said container, said hemispherical and cylindrical parts defining an interior space, a platform connected in said first portion of said container for supporting a projector, said cylindrical part having a plurality of horizontally extending openings therethrough, one of which is provided on the side of said cylindrical part opposite said vertical guide for permitting projecting therethrough and at least one other of said openings provided for establishing access with the interior of said container, said vertical guide and said central vertical axis lying in a common central vertical plane, said horizontally extending openings through said cylindrical part being spaced away from said central vertical plane; and

securing means connected between said slide and said track for securing said slide, and said container, and at a selected vertical position with respect to said guide.

4,573,749

MODULAR STORAGE RACK FOR TAPES

Vito Massaro, 200 Seahorse Ct., Marco Island, Fla. 33937

Filed Oct. 21, 1983, Ser. No. 544,133

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—12 **13 Claims**

1. A modular rack unit for holding a plurality of tapes in tape covers, comprising:

a back;

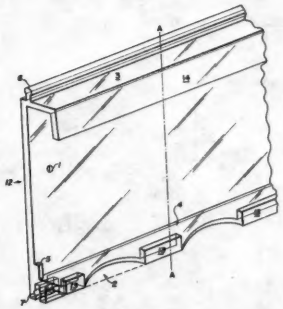
an upper ledge projecting substantially forwardly from a top portion of the back;

a lower ledge projecting substantially forwardly from a bottom portion of the back and having a plurality of portions thereof cut away, each cut-away portion being sized so that a finger can be inserted therethrough;

a runner projecting substantially upwardly from the upper portion of the back;

jaw means projecting substantially downwardly from the bottom portion of the back capable of engaging a runner of an adjacent substantially identical modular rack unit, said jaw means and said runner being sized so as to space the modular rack unit from any adjacent substantially identical modular rack unit when the jaw means of said unit engage the runner of the adjacent unit such that a finger can be inserted between said lower ledge of said unit and the upper ledge of the adjacent unit and into said cut-away portions;

an upper retainer projecting substantially downwardly from the upper ledge and spaced apart from the back by slightly more than the thickness of a tape cover;



a lower retainer projecting substantially upwardly from the lower ledge and spaced apart from the back by slightly more than the thickness of a tape cover;

said upper and lower ledges being spaced apart and said upper and lower retainers being of sizes such that a top of a tape cover may be inserted into a space between the back, the upper ledge and the upper retainer far enough to allow a bottom of the tape cover to pass over a top of the lower retainer, and such that when a tape cover so inserted then is lowered so that the bottom thereof rests on the lower ledge between the back and the lower retainer, the top thereof cannot pass under the upper retainer; and

wherein the modular unit is of a length to hold a plurality of tape covers and at least one said cut-away portion is provided for each portion of said length corresponding to the length of a tape cover.

4,573,750

DISPENSING APPARATUS

John B. Golby, Swannington Leics, Great Britain, assignor to Glynwed Screws & Fastenings Limited, Birmingham, England

Filed Jan. 6, 1984, Ser. No. 568,601

Claims priority, application United Kingdom, Jan. 8, 1983, 8300477

Int. Cl.[4] B65H *19/00*

U.S. Cl. 312—38 **4 Claims**

1. Manually powered towelling dispensing apparatus of the kind in which a user by manually pulling on towelling removes clean towelling from a supply, the apparatus having:

a. a housing to accommodate a roll of clean towelling to be dispensed and to accommodate said dispensed towelling in a roll after it becomes soiled by use;

b. towelling control means including a dispensed towelling take-up, said towelling control means being drivably coupled to said clean towelling to be dispensed and drivably interconnecting said clean towelling being dispensed with said dispensed towelling being rewound for driving said dispensed towelling take-up in response to withdrawal of said clean towelling from the supply;

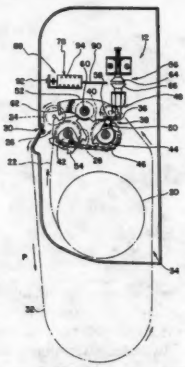
c. said towelling control means further including means for limiting the length of clean towelling dispensed in each manual dispensing operation, said limiting means having a pair of mutually engagable suction cups for holding said limiting means in a limiting condition when said suction cups are in vacuum engagement to inhibit the dispensing of clean towelling;

characterized by

d. towelling end wind-up means operable in the absence of manual intervention for winding into said housing an end of a roll of clean towelling after the remainder of said roll of clean towelling has been dispensed manually, said wind-up means comprising:

(1) electrically responsive towelling end detection means for generating an electrical signal upon detection of an end of a length of clean towelling;

(2) an electrical control circuit for controlling said towelling end wind-up means;



(3) electrically operated disabling means, including a disabling element, said disabling means being electrically connected to said electrical control circuit and responsive to said signal from said towelling end detection means for displacing said disabling element to a disabling position between said suction cups upon detection of said towelling end to maintain said limiting mechanism in a non-limiting condition in which vacuum engagement of said suction cups is prevented and dispensing of clean towelling is not inhibited; and

(4) an electrically actuated motor for towelling winding and electrically connected to said electrical control circuit and mechanically connected to the towelling control means to drive said towelling control means in a direction for dispensed towelling take-up while said limiting means is maintained in its nonlimiting condition to permit continuous winding of said towelling end.

4,573,751

COMBINATION MULTIPLE COMPARTMENT STORAGE BIN AND SORTING TRAY

Robert P. Swank, Mansfield, Ohio, assignor to Leiter Swank Industries, Inc., Lexington, Ohio

Filed May 7, 1984, Ser. No. 607,507

Int. Cl.[4] B65B *67/02*; B65D *91/00*

U.S. Cl. 312—211 **16 Claims**

1. Apparatus for sorting comprising:

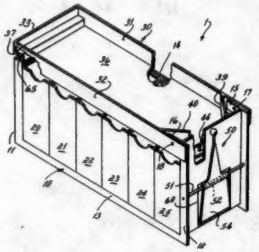
a frame having first and second oppositely disposed generally horizontal end walls;

said frame including tray means for receiving articles;

said tray means being pivotally mounted about the top of said first end wall of said frame to pivot between a first horizontal position and a second angled position;

said frame end walls defining a receiving area therebetween for articles;

said tray means including egress means near said first end wall and overlying a portion of said receiving area for facilitating egress of said articles from said tray means into said receiving area as said tray means is pivoted from said first position to said second position;



chute means mounted transversely across said first end wall of said frame and positioned adjacent said tray egress means and cooperating therewith for blocking egress of said articles from said tray means through said egress means when said tray means is in said first position and for guiding said articles into said receiving area as said tray means is pivoted from said first position to said second position.

4,573,752

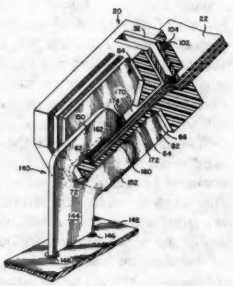
FLAT CABLE CONNECTION SYSTEM

Donald S. Rich, Long Valley, N.J., assignor to Parlex Corporation, Methuen, Mass.

Filed Apr. 4, 1984, Ser. No. 596,543

Int. Cl.[4] H01R *9/07*

U.S. Cl. 339—17 F **12 Claims**



1. A connection system for use with a flat cable having conductors located on a narrow pitch comprising:

a substrate having offset apertures therein;

female contacts having leads extending into associated apertures in said substrate and electrically and mechanically coupled thereto, each of said female contacts having a U-shaped forward portion having two spaced apart contact arms, said contacts being located on a pitch corresponding to the pitch of the conductors in said cable; and

a monolithic connector housing having opposed ends, and opposed upper and lower outer surfaces, said monolithic connector housing having an integral generally planar flat cable insertion channel disposed along a first plane centrally therein, in open communication with one end thereof that extends internally of and terminates within

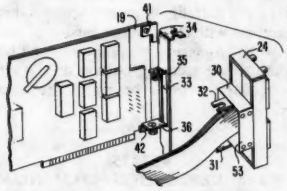
said housing at an abutment that limits placement of said flat cable, said cable insertion channel adapted to receive by movement through said one end of said housing an end of said flat cable that is inserted into said monolithic connector housing the end of which cable terminates generally internally thereof proximate said abutment, said housing having integral walls defining plural vertically displaced opposing pairs of contact-receiving slots in open communication with the other end thereof, with each of said vertically displaced pairs of contact-receiving slots disposed along a second common plane generally transverse said first plane and such that respective ones of said slots of said opposing pairs of slots are disposed to either side of said first plane, said walls defining said contact-receiving slots of said pairs of slots being integrally formed in said monolithic connector housing in such a way that they are laterally spaced in a direction defined by the normal to each of said second planes and along said other end with respective ones of said vertically displaced pairs being in open communication with a corresponding one of said upper and lower outer surfaces, said contact-receiving slots of said plural opposing pairs of slots are located on a pitch corresponding to the pitch of the conductors in said cable, one contact-receiving slot of each of said pairs in open communication with said cable insertion channel internally of said monolithic connector housing, with the opposing contact-receiving slot of each of said pairs stopping short of communication with said channel defining a corresponding shelf portion between said opposing one of each of said pairs and an inserted cable, said shelf providing a predetermined thickness to the cable, the contact arms of each of said female contacts adapted to be inserted into associated vertically displaced and directly opposed contact-receiving slot pairs, such that one arm contacts an exposed conductor on one side of said cable, whereas the opposing arm of an associated female contact is positioned to directly contact the side of an associated one of said shelves away from said conductor.

4,573,753

CONNECTOR ADAPTER FOR PRINTED CIRCUIT BOARD OF COMPUTER

Allen W. Vogl, 642 Tulane Ave., Melbourne, Fla. 32901

Filed Nov. 2, 1984, Ser. No. 667,754
Int. Cl.[4] H01R *23/68*
U.S. Cl. 339—17 LM **14 Claims**



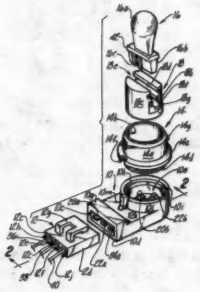
1. In a cabinet containing at least one printed circuit board mounted therein and comprising an outer panel having at least one expansion opening therein to permit devices external to the cabinet to be electrically connected to the printed circuit board, the improvement comprising a connector adapter adapted to be added onto said cabinet for making a plurality of electrical connections with the printed circuit board from said external devices, said adapter comprising a housing with a plurality of multiple pin electrical connectors, said housing being adapted to be applied to the outside of said cabinet with a portion of said housing being inserted into said expansion opening of the cabinet, means for electrically connecting said plurality of multiple pin connectors to said printed circuit board, a mounting bracket adapted to be located inside said cabinet, means for releasably mechanically connecting said bracket directly to said printed circuit board and means for releasably mechanically connecting said mounting bracket to said portion of the housing inserted into said expansion opening.

4,573,754

LAMP ASSEMBLY

Clinton W. Hill, Romeo, Mich., assignor to U.S. Plastics Corp., Mt. Clemens, Mich.

Filed Mar. 14, 1984, Ser. No. 589,365
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—60 M **23 Claims**



1. A lamp assembly comprising:

(A) a base having a peripheral wall defining a socket cavity having an opening in one face of said base;

(B) a socket assembly defining a bulb cavity and including a plurality of contact elements having their one ends positioned in said bulb cavity to electrically connect with a bulb inserted into said bulb cavity and having their other ends positioned at one end of said socket assembly;

(C) a plurality of elongated conductors passing sealingly through said wall of said base to position their one ends in said socket cavity;

(D) coacting means on said socket assembly adjacent said one end thereof and on said wall resiliently yieldable in response to insertion of said one end of said socket assembly into said socket cavity through said opening to sealingly mount said one socket assembly end in said socket cavity by effecting sealing engagement between said coacting means entirely around said socket cavity and also to connect said other ends of said contact elements in respective electrical contact with said one ends of said conductors.

4,573,755

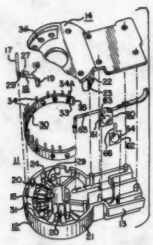
SPARK GAP DEVICE FOR A CATHODE RAY TUBE SOCKET

Stephen S. Simovits, Jr., Downers Grove, Ill., assignor to American Plasticraft Co., Chicago, Ill.

Continuation of Ser. No. 391,576, Jun. 24, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,471
Int. Cl.[4] H01R *13/53*
U.S. Cl. 339—111 **2 Claims**

1. A tube socket comprising a dielectric body, spark gap portions each having at least a pair of conductive electrodes disposed in spaced relation to one another, a flexible conductive link for coupling to one electrode of said pairs, conductive fingers extending from the other electrode of said pairs for connection to associated electronic circuitry, a unitary flexible elongated plastic band substantially completely encapsulating said flexible conductive link and encapsulating portions of said conductive fingers, spaced sections along said band being recessed to expose a portion of the associated finger, said band

being bendable in the arc of a circle for mounting in said dielectric body, and said band having apertures formed at said spark gap portion location for forming an air dielectric chamber,



spaced apertures along the length of said band to enhance the flexibility of said band and reduce the bending stresses, and said band being receivable in said dielectric body.

4,573,756

ELECTRICAL INTERFACE ARRANGEMENTS

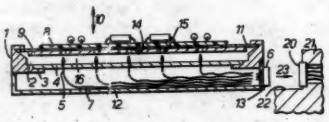
John L. Smith, and Frank H. Jenner, both of St. Albans, England, assignors to Marconi Instruments Limited, St. Albans, England

Filed Oct. 20, 1982, Ser. No. 435,362

Claims priority, application United Kingdom, Oct. 21, 1981, 8131775

Int. Cl.⁴ H01R *11/18*

U.S. Cl. 339—117 P **5 Claims**



1. An electrical interface arrangement for establishing a plurality of electrical connections between a circuit board to be tested and electrical test equipment having a first electrical connector, said arrangement including:

a bed plate having opposite sides;

a plurality of electrical contacts mounted by said bed plate and projecting from one side of said bed plate for contacting selected areas of a circuit board, each said contact having an electrical terminal projecting from the other side of said bed plate, said electrical terminals collectively defining a plane;

a second electrical connector including a plurality of electrical terminals and being pivotably mounted relative to said bed plate for movement between first and second positions, in the first position said second electrical connector being disposed for engaging the first electrical connector of the electrical test equipment and in the second position said second electrical connector being disposed so that said plurality of electrical terminals are held in a plane which is substantially coplanar with the plane defined by the terminals projecting from the other side of said bed plate; and

electrical wire connections connecting the terminals projecting from the other side of said bed plate and said plurality of terminals of said second connector, said wire connections being formed by an automated wire wrapping machine while said second connector is disposed in the second position.

4,573,757

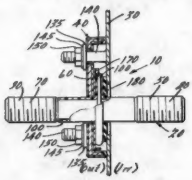
TRANSFORMER BUSHING

John P. Cochran, Charlotte, N.C., and Herbert J. Macemon, Versailles, Ky., assignors to Kuhlman Corporation, Troy, Mich.

Continuation of Ser. No. 561,990, Dec. 14, 1983, abandoned, which is a continuation of Ser. No. 182,232, Aug. 28, 1980, abandoned. This application Mar. 1, 1985, Ser. No. 707,178

Int. Cl.⁴ H02B *1/02*

U.S. Cl. 339—126 RS **18 Claims**



1. A bushing assembly for use with a tank-type electrical transformer adapted to be inserted through an opening in the outer casing of the electrical transformer, said bushing assembly being comprised of a bushing stud and means for securing said stud to the transformer, said bushing stud comprising:

a first connector portion made of a conductive material and adapted for connection to an electrical lead within the transformer,

a securing portion integral with and made of the same conductive material as said first connector portion, but of a larger diameter, said securing portion adapted to be mounted adjacent the outer casing of the electrical transformer,

a second connector portion integral with and made of the same conductive material as said first connector portion and said securing portion, but of a smaller diameter than said securing portion, said second connector portion adapted for connection to an electrical lead outside the transformer,

said securing portion having a relatively thin layer of insulating material thereon, and

said means for securing said stud to the transformer comprising an externally mating clamp assembly having a central alignment hole for passing around said second connector portion, and a plurality of mounting holes therein adapted for alignment with studs on the outside of the transformer tank, and having insulating properties and being adapted for locating said securing portion on the outside of the tank adjacent the outer casing of the electrical transformer.

4,573,758

BEAM DEFLECTION MECHANISM

Joel Hecker, Port Jefferson Station; Howard Stern, Greenlawn, and Thomas Heydenburg, East Setauket, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

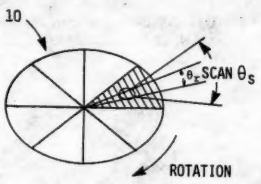
Filed May 31, 1984, Ser. No. 615,817

Int. Cl.⁴ G02B *5/32*

U.S. Cl. 350—3.71 **8 Claims**

1. An arrangement for deflecting a beam of monochromatic light substantially rapidly and accurately, comprising: a rotatable disk having Fresnel zone plate segments and an axis of rotation; said zone plate segments having axes of symmetry placed substantially co-linear with the axis of rotation of said rotatable disk for reducing sensitivity to angular rate of rotation of said disk; means for driving said disk; a source of monochromatic light for directing a beam of monochromatic light through said disk and said segments for deflecting said beam by a predetermined angle, said beam remaining stationary and focused on a point of the axis of rotation while said beam

resides in any one segment, said beam being stably positioned by being switched sufficiently rapidly from one location to



another as lens segments with differing focal distances pass through the light beam.

4,573,759

OPTICAL DISPLAY APPARATUS

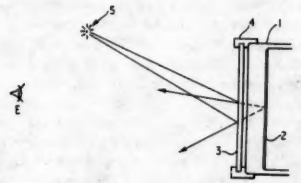
David W. Swift, Prestatyn, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Jun. 21, 1982, Ser. No. 390,520

Claims priority, application United Kingdom, Jul. 7, 1981, 8120875

Int. Cl.⁴ G03H *1/22*

U.S. Cl. 350—3.85 **12 Claims**



1. Optical display apparatus comprising a display source having a display surface on which first visual information can be displayed, a holographic element providing a reflection hologram of second visual information recorded so as to define a holographic image surface of a configuration corresponding to the configuration of the display surface and located at a distance behind the holographic element, means mounting the holographic element at a corresponding distance in front of the display surface, and means located in front of the holographic element for illuminating the element so that the holographic image surface coincides with the display surface.

4,573,760

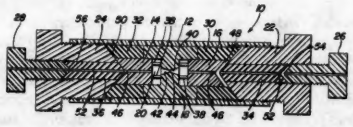
CONNECTOR SYSTEM FOR A SINGLE OPTICAL FIBER

Robert J. Fan, 18951 Kettridge St., Apt. #84, Reseda, Calif. 91355, and Teunis Visser, 3412 Orange Grove Ave., Chino, Calif. 91710

Continuation-in-part of Ser. No. 340,822, Jan. 19, 1982. This application Mar. 2, 1984, Ser. No. 585,784

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **14 Claims**



1. A fiber optic connector system comprising:

a pair of single optical fibers;

a connector tube;

a lens spacer internally placed substantially in the center of said connector tube;

a pair of positioning sleeves having a bore abutting said lens spacer, said positioning sleeves having a center bore slightly larger than said optical fiber;

a hole in said lens spacer that is optically aligned with the center bore of said positioning sleeves and said clamping screws;

means for securing and sealing said positioning sleeves in said connector tube;

means for aligning said optical fibers;

means for clamping said optical fibers:

a cutter for cutting said optical fibers whrein the cut end is substantially perpendicular to the axis of said optical fiber;

means for melting each cut end of said optical fibers whrein said melted ends will form sustantially hemispherical beads;

means for securing said optical fibers with said hemispherical beads in each end of said connector tube wherein said hemispherical beads are seperated by said lens spacer a distance of 1½ and 2½ times the diameter of said optical fibers;

coupling means between said hemispherical beads inside connector tube wherein said coupling means is a viscous fluid whose index of refraction is between 1.38 and 1.58;

adjusting means for maximizing light transmission through said optical fibers and,

locking means for securing said adjusting means to said connector tube.

4,573,761

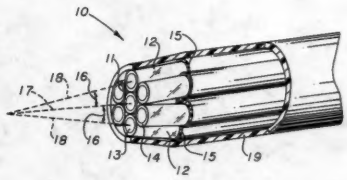
FIBER-OPTIC PROBE FOR SENSITIVE RAMAN ANALYSIS

Richard D. McLachlan; Gary L. Jewett, and John C. Evans, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 14, 1983, Ser. No. 531,877

Int. Cl.⁴ G02B *5/16*

U.S. Cl. 350—96.24 **14 Claims**



1. A fiber-optic probe for sensitive Raman analysis and useful for light scattering or luminescence measurements, generally, the probe beneficially not requiring a focusing lens and comprising:

(a) at least one optical fiber for transmitting light into a sample; and

(b) at least two optical fibers for collecting light from the sample which are in closely spaced relationship with the transmitting fiber for purposes of sensitive Raman analysis; wherein the collecting fibers converge with the axis of the transmitting fiber at an angle less than 45 degrees and which produces substantially greater sensitivity for Raman analysis than if arranged parallel.

4,573,762

GERMANIUM-FREE OPTICAL FIBERS HAVING LARGE NUMERICAL APERTURES

Hendrik J. M. Joormann, and Gijsbertus A. C. M. Spierings, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,429
Int. Cl.[4] G02B *6/00, 6/18*
U.S. Cl. 350—96.34 11 Claims

1. A germanium-free optical fiber comprising a core and a cladding surrounding the core, characterized in that:

the core consists essentially of a glass having a refractive index and a viscosity, and having the molecular composition:

57.5–65% SiO_2;

0–5% of at least one of the group consisting of ZrO_2 and $\frac{1}{2}Y_2O_3$;

10–25% of at least one of the group consisting of Li_2O, Na_2O, and K_2O; and

12.5–27.5% of at least one of the group consisting of MgO, CaO, SrO, BaO, and ZnO, but with no more than 5% MgO, 10% CaO, 7.5% SrO, 15% BaO, and 20% ZnO, and provided that if there is no BaO, then not less than 12.5% ZnO, and if there is no ZnO, then not less than 5% BaO; and

the cladding consists essentially of a silicate glass having a refractive index which is at least 2% lower than the refractive index of the core glass, said cladding glass having a viscosity which is 0.5–2.0 times the viscosity of the core glass at a temperature at which the optical fiber is processed, said cladding glass having the composition:

60–67.5% SiO_2;

10–25% of at least one of the group consisting of ZnO, CaO, and MgO, but with no more than 10% ZnO, 5% CaO, and 10% MgO, and

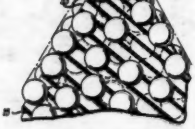
10–25% of at least one of the group consisting of Li_2O, Na_2O, and K_2O.

4,573,763

THREE-DIMENSIONAL FLEXIBLE REFLECTORS

Robert J. Thomas, Anchorage, Ak., assignor to Eagle Industries, Inc., Anchorage, Ak.

Filed Dec. 18, 1984, Ser. No. 682,836
Int. Cl.[4] E01F *9/00;* G02B *5/132*
U.S. Cl. 350—105 24 Claims



1. A reflective marker comprising:

a base member of elastomeric material forming a support body for said marker; and

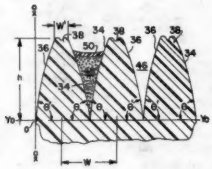
a plurality of individual resilient members of elastomeric material integrally formed with said base member and projecting therefrom, each of said resilient members having embedded therein and throughout a plurality of retroreflective glass beads, at least the distal ends of said resilient members having a surface portion of the elastomeric material forming said resilient members removed to expose a portion of the glass beads thereat.

4,573,764

REAR PROJECTION SCREEN

Ralph H. Bradley, Kingsport, Tenn., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,101
Int. Cl.[4] G03B *21/60*
U.S. Cl. 350—128 25 Claims



1. A lenticular lens comprising a base portion, a first side portion, a second side portion, and a tip portion opposite said base portion;

said first side portion having an average slope of between approximately 70° and 85° with respect to said base portion;

said second side portion having an average slope of between approximately 70° and 85° with respect to said base portion;

said first average slope and said second average slope being selected so that said first side portion and said second side portion are substantially internally reflective;

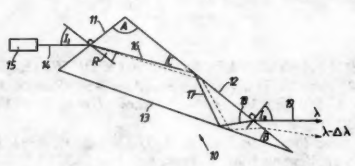
said tip portion being contiguous with both said first side portion and second side portion, said tip portion comprising two convex cylindrical portions of equal radii and a central concave cylindrical portion and said tip portion being substantially refractive, wherein the ratio of the height of said lens to the width of said base portion is greater than 3:2 and the ratio of the width of said base portion to the width of said tip portion is greater than 2:1.

4,573,765

DISPERSIVE PRISM ARRANGEMENT

Clive L. M. Ireland, Rugby, England, assignor to J. K. Lasers Limited, Warwickshire, England

Filed Aug. 8, 1984, Ser. No. 638,711
Claims priority, application United Kingdom, Aug. 20, 1983, 8322478
Int. Cl.[4] G02B *5/04*
U.S. Cl. 350—286 6 Claims

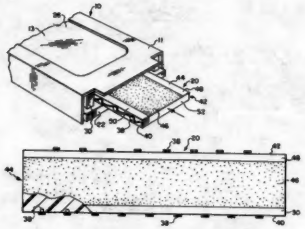


1. A dispersive prism arrangement comprising a rotatably mounted prism having three faces which are inclined to each other so that when an input beam of a particular wavelength is incident on the first face the prism may be rotated to a position where the incident beam is refracted at the first face, the refracted beam from the first face is incident on the second face where it is reflected, the reflected beam from the second face is incident on the third face where it is reflected, the reflected beam from the third face is incident on the second face where it is refracted to form an output beam, and the output beam is at zero deviation from the input beam.

4,573,766
LED STAGGERED BACK LIGHTING PANEL FOR LCD MODULE

Frederick M. Bournay, Jr., and Joel F. Giurtino, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Dec. 19, 1983, Ser. No. 562,855
Int. Cl.[4] G02F *1/133*; G09F *9/00, 9/30*; F21V *7/04*
U.S. Cl. 350—345 **12 Claims**

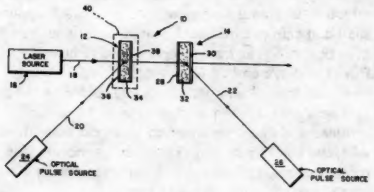


9. A method for providing backlighting in a visual display device including: providing a liquid crystal display unit, providing a flat rectangular panel of light transmitting material having a flat front surface, a flat back surface, and opposite elongate edges; providing a light diffusing surface area on said front surface of said panel; directing light into said elongate edges of said panel of light transmitting material to cause said light transmitting material to transmit diffused light therefrom through said front flat surface thereby backlighting said liquid crystal unit; forming said light emitting means from a plurality of light emitting diodes; and positioning a plurality of the light emitting diodes on one edge to be staggered or offset from a plurality of the light emitting diodes along the opposite edge.

4,573,767
OPTICAL FLIP-FLOP SYSTEM

Jack L. Jewell, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 31, 1984, Ser. No. 615,612
Int. Cl.[4] G02F *1/21*
U.S. Cl. 350—354 **10 Claims**



1. An optical flip-flop system comprising:

first means in the form of a nonlinear Fabry-Perot etalon for receiving a beam of electromagnetic radiation at a preselected wavelength and for transmitting said beam therethrough when said first means is in a transmissive state and for preventing said beam from passing therethrough upon the application of a first signal thereto which changes said first means to a nontransmissive state; and

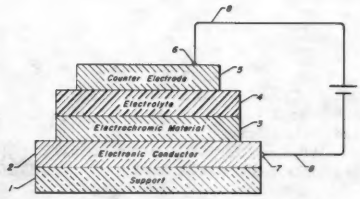
second means in the form of a nonlinear Fabry-Perot etalon being initially in a nontransmissive state and optically aligned with said first means for receiving said beam of electromagnetic radiation from said first means and for transmitting said beam therethrough upon the application of a second signal thereto which causes said second means to be in a transmissive state, and for preventing said beam from passing therethrough when said first means is in the nontransmissive state, said nontransmissive state of said first means causing said second means to change back to said nontransmissive state; and

whereby said transmissive or nontransmissive states of said flip-flop system are controlled by said signals applied to said first and second means.

4,573,768
ELECTROCHROMIC DEVICES

Anthony J. Polak, Lake Zurich; James A. Wrezel, Buffalo Grove, and Allyson J. Beuhler, Indian Head Park, all of Ill., assignors to The Signal Companies, Inc., La Jolla, Calif.

Filed Dec. 5, 1983, Ser. No. 558,231
Int. Cl.[4] G02F *1/01*
U.S. Cl. 350—357 **37 Claims**

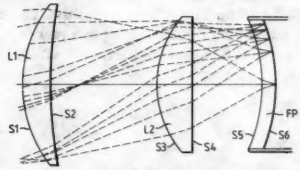


1. An electrochromic device comprising in combination an electronic conductor, an electrochromic material in contact with said conductor, a solid electrolyte formed as a solution phase blend in a mutually miscible solvent of an organic polymer and a heteropoly acid or salt thereof disposed on said electrochromic material and a counter-electrode in contact with said solid electrolyte.

4,573,769
PROJECTION LENS SYSTEM

John A. Clarke, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,376
Claims priority, application United Kingdom, Jul. 25, 1983, 8319938
Int. Cl.[4] G02B *9/06, 17/08*
U.S. Cl. 350—432 **7 Claims**



1. A lens system for projecting an image of a concave object surface onto a planar display screen, characterized in that the lens system comprises two elements, each of positive power and each having one aspheric surface, the powers of the elements being chosen so that

$$0.4K < K_1 < 0.60K \text{ and}$$

$$0.75K < K_2 < 1.05K$$

where K_1 is the power of the element remote from the object surface, K_2 is the power of the element adjacent the object

surface and K is the total power of the lens system, each aspheric surface being defined by the following relationship:

$$Z = \frac{Cs^2}{1 + \sqrt{1 - \epsilon C^2 s^2}} + a_4 s^4 + a_6 s^6 + a_8 s^8 + a_{10} s^{10}$$

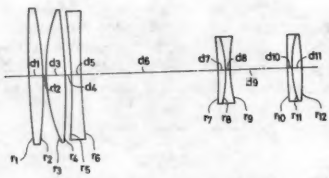
where Z is a deviation, in the axial direction, of the surface from a plane normal to the optical axis and tangent to the surface at its pole for a zone of the surface which is at a distance s from the axis, C is a curvature of the surface on the axis, ϵ is a conic constant, and a_4, a_6, a_8 and a_{10} are constants for the surface.

4,573,770

TELEPHOTO LENS SYSTEM

Shinichi Mizuno, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 620,329
Claims priority, application Japan, Jun. 17, 1983, 58-107863
Int. Cl.[4] G02B *9/60, 9/62, 13/02*
U.S. Cl. 350—454 **8 Claims**



1. A telephoto lens system comprising a front lens group, and a rear lens group comprising a first subgroup and a second subgroup, said front lens group comprising a first positive lens component, a second positive lens component and a negative lens component, and having positive refractive power as a whole, said first subgroup comprising a negative cemented lens component and having negative refractive power as a whole, said second subgroup comprising a positive cemented lens component and having positive refractive power as a whole, and said lens system being so designed as to satisfy the following conditions (1) through (3):

$$0.2 < \frac{\phi_1}{\phi_2} < 0.8 \quad (1)$$

$$-1 < \frac{r_3 + r_4}{r_3 - r_4} < 0 \quad (2)$$

$$1 < \left| \frac{\phi_3}{\phi_1} \right| < 2 \quad (3)$$

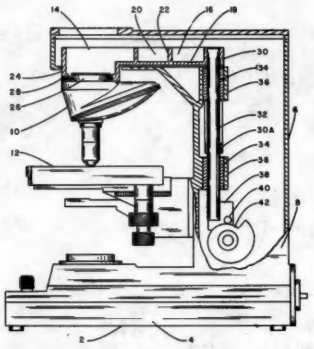
wherein the reference symbols ϕ_1, ϕ_2, and ϕ_3 represent refractive powers of the first positive lens component, second positive lens component and negative lens component respectively arranged in said front lens group, and the reference symbols r_3 and r_4 designate radii of curvature on the object side surface and image side surface respectively of the second positive lens component arranged in said front lens group.

4,573,771

MICROSCOPE ADJUSTMENT APPARATUS

Arthur T. Hill, Williamsville, N.Y., assignor to Warner-Lambert Technologies, Inc., Morris Plains, N.J.

Filed Jul. 2, 1984, Ser. No. 627,318
Int. Cl.[4] G05G *11/00*; F16H *37/06*
U.S. Cl. 350—521 **20 Claims**



1. A microscope having a frame comprising a base and an arm assembly extending upwardly therefrom, a nosepiece, and an adjustment system for moving said nosepiece relative to said arm assembly, said adjustment system including:

a nosepiece support mounted on said arm assembly for movement relative thereto,

a cam shaft rotatably mounted on said frame, a cam fixed to said cam shaft for rotation therewith, said cam being operatively engaged with said nosepiece support for movement thereof to effect adjustment of said nosepiece, said cam shaft having a free drive end remote from said cam,

a reduction gear train system releasably engaged with the free drive end of said cam shaft for rotation thereof and selective direct removal therefrom, said gear train system comprising multiple drivingly engaged gears,

a gear box mounting said reduction gear train system,

a coarse adjustment handwheel mounted to said gear box whereby rotation of said coarse adjustment handwheel is effective to rotate said gear box, gear train system, cam shaft and cam as a unit, said coarse adjustment handwheel, gear box and gear train system being removable as a unit from the drive end of said cam shaft,

a gear train drive shaft operatively engaged with the gears of said gear train system, and

a vernier handwheel mounted to said gear train drive shaft whereby rotation of said vernier handwheel is effective to rotate the gears of said gear train system with a resultant rotation of the cam shaft and cam.

4,573,772

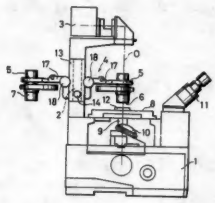
INVERTED-DESIGN MICROSCOPE

Itaru Endo, and Yasuo Inoue, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,513
Claims priority, application Japan, Sep. 5, 1983, 58-137657; Sep. 5, 1983, 58-137658
Int. Cl.[4] G02B *21/14, 21/22*
U.S. Cl. 350—526 **9 Claims**

1. An inverted-design microscope comprising a microscope

body, a pillar erected on said microscope body and supporting a light source means on the top, and a rotary pillar mounted



rotatably around said pillar and provided with at least one arm capable of holding an accessory device above a stage.

4,573,773

PERISCOPE-LIKE SIGHTING DEVICE

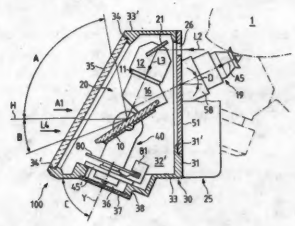
Klaus Arndt, Mägenwil, and Saverio Sanvido, Glattbrugg, both of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed May 2, 1984, Ser. No. 606,398

Claims priority, application Switzerland, May 17, 1983, 2671/83

Int. Cl.⁴ G02B *23/04, 23/08, 23/16*

U.S. Cl. 350—541 **11 Claims**



1. A periscope-like sighting device comprising:

a housing;

a multiple-element optical system arranged in said housing and intended for the localization and tracking of a target, said optical system comprising:

a first deflecting prism;

objective lens means;

a first beam splitter;

a second beam splitter;

a second deflecting prism;

a main mirror operatively associated with said first deflecting prism;

said main mirror and the optical system being arranged in the housing to slope backward from bottom to top in relation to a substantially vertical rear wall of the housing in a direction of incident radiation;

the main mirror being mounted in a mirror head arranged sloping backward in the housing to perform a pivoting motion about a first axis; and

the main mirror being mounted to perform a rotating motion about a second axis conjointly with said mirror head.

4,573,774

SOFT TORIC CONTACT LENS

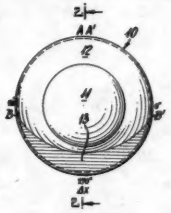
George Sitterle, Jacksonville, Fla., assignor to Vistakon, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 306,438, Sep. 28, 1981, Pat. No. 4,508,436. This application Feb. 19, 1985, Ser. No. 703,010

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.⁴ G02C *7/04*

U.S. Cl. 351—160 H **8 Claims**



1. A soft toric contact lens of spherocylindrical power having a concave inner surface, a convex outer surface, a horizontal axis and a vertical axis;

said outer surface having a central optical zone and a peripheral lenticular zone;

said lens including a prism ballast in the vertical axis, the degree of prism being from about 0.5 to 1.0 diopter;

the outer surface of said lens having a smoothly beveled tapered-off region in the lenticular zone in the area of maximum ballast, the edge of said lens having a substantially uniform thickness in said tapered-off region.

4,573,775

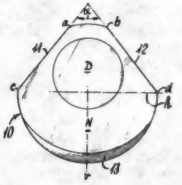
BIFOCAL CONTACT LENS

Charles A. Bayshore, Orlando, Fla., assignor to Vistakon, Inc., Jacksonville, Fla.

Filed Aug. 19, 1982, Ser. No. 409,467

Int. Cl.⁴ G02C *7/04, 7/06*

U.S. Cl. 351—161 **27 Claims**



1. A multifocal contact lens comprising a lens body with a generally spherical, concave inner surface adapted to fit the cornea of a human eye, and a generally convex outer surface;

said lens body having a central, horizontal axis defining a superior portion of the lens and an inferior portion;

said lens body having a central vertical axis which, at the point of intersection with said horizontal axis, defines the geometric center of the lens;

the superior portion of said lens body being substantially equiangularly truncated from points on either side of the vertical axis at the apex of the lens to points on each respective side proximal the horizontal axis;

the inferior portion of said lens body being defined by an arc of substantially uniform radius from the geometric center of the lens over a major portion of the perimeter thereof;

said lens including a first optical zone having at lease a major portion thereof in the superior portion of the lens;

said lens including a second optical zone having at least a major portion thereof in the inferior portion of the lens;

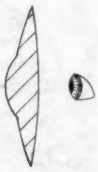
the focal length of said second optical zone being shorter than that of said first optical zone.

4,573,776

BICONVEX APHAKIC PROSTHETIC LENS

Philip M. Frieder, Miami, and Edward deRojas, Lauderhill, both of Fla., assignors to Optical Systems International Inc., Hialeah, Fla.

Filed Dec. 12, 1983, Ser. No. 560,165
Int. Cl.[4] G02B 3/04; G02C 7/02
U.S. Cl. 351—167 4 Claims



1. An aphakic lens having a front surface, an ocular surface, and a central zone of a predetermined convex correction in an amount from 8 to 24 diopters characterized by:

a convex correction on the ocular surface in the range of +0.25 to 6.00 diopters to add to the front base curve corrections,

and a flattening rate in the asphericity from the central zone based upon a 60 millimeter lens in accordance with the following formula:

Front Base Curve	Power at Edge of 60 mm Lens
+8.00 D.	+5.00 D.
+10.00 D.	+4.50 D.
+12.00 D.	+4.00 D.
+14.00 D.	+5.00 D.

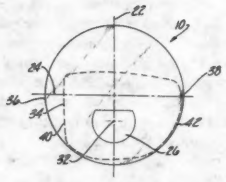
whereby the front base curve of a 60 mm lense is flattened to about +5.00 diopters at the edge and when added to the ocular correction the diopter drop per millimeter is between about 0.4 and 0.9.

4,573,777

ASPHERIC SPECTACLE LENS BLANK

Alexander C. Bristol, 5480 SW. 85 St., Miami, Fla. 33143

Filed Mar. 8, 1984, Ser. No. 587,678
Int. Cl.[4] G02C 7/02, 7/06
U.S. Cl. 351—167 4 Claims



1. A lens for either a left or right aphakic eye comprising:

a lens body having a posterior surface and an aspheric anterior surface, said lens body having a vertical centerline and a horizontal centerline which intersect at an optical center of the lens body,

a bifocal segment having a flat top and an optical center, said bifocal segment optical center being substantially aligned with said vertical centerline but spaced downwardly from said horizontal centerline so that said flat top is substantially parallel to but spaced downwardly from said horizontal centerline by a predetermined distance, and

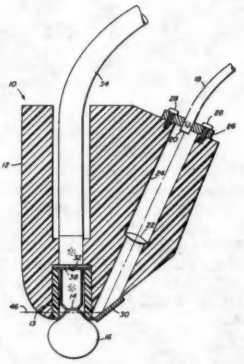
wherein the lens for either the left or right eye is formed by trimming said lens body so that said bifocal segment is nasally decentered.

4,573,778

AQUEOUS FLUOROPHOTOMETER

Jerrold M. Shapiro, Framingham, Mass., assignor to Boston University, Boston, Mass.

Filed Mar. 16, 1983, Ser. No. 475,854
Int. Cl.[4] A61B 3/00
U.S. Cl. 351—219 14 Claims



1. A device suitable for detecting the fluorescence of the aqueous humor in the anterior chamber of an eye comprising:

a flexible water impermeable contact lens membrane for placement against the cornea of the eye;

a fluid enclosed in a fluid chamber by the contact lens membrane;

means for changing the pressure of the fluid in the chamber to change the curvature of the flexible contact lens membrane;

a light source;

a mirror mounted to one side of the contact lens membrane for reflecting light from the light source through the contact lens membrane across the anterior chamber of the eye; and

means for detecting light which passes outwardly from the anterior chamber through the contact lens membrane and the fluid chamber.

4,573,779

VARIABLE SIZE CIRCULAR APERTURE CAMERA

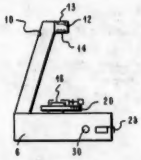
Guy A. Deighton, Delray Beach, Fla., and Gerry W. Moore, Leander, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,298
Int. Cl.[4] G03B 41/00
U.S. Cl. 354—4 10 Claims

1. A method of exposing variably sized circular apertures on a photo sensitive surface including the steps of:

providing a variable length linear light source spaced away from the photosensitive surface; and

simultaneously causing relative rotation about an axis of rotation passing through the center of the photosensitive



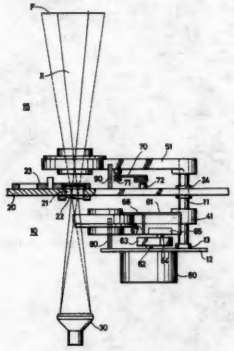
surface and through the light source between the photosensitive surface and the light source.

4,573,780

PHOTOGRAPHIC RECORDING DEVICE FOR VIDEO IMAGE

Susumu Sato, and Hideharu Oshima, both of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Dec. 19, 1984, Ser. No. 683,525
Claims priority, application Japan, Dec. 28, 1983, 58-245092
Int. Cl.[4] G03B *3/00, 29/00*
U.S. Cl. 354—195.12 **6 Claims**



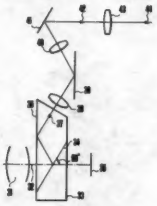
1. A photographic recording device of a type having first and second lenses of different focal lengths and alternatively insertable into an optical path of said device for recording, on a photosensitive recording medium, video images displayed on a CRT device, comprising: first and second lens arms supporting at first ends thereof said first and second lenses, respectively; a rotatable shaft, second ends of said first and second lens arms being fixedly secured to said rotatable shaft with a vertical clearance therebetween and with a predetermined angle therebetween; rotary drive means; means for converting rotary movement of said rotary drive means into reciprocal swinging movement of said first and second lens arms; a snap spring for biasing said first and second lens arms in either direction selectively; first stop means for limiting swinging movement of said first lens arm in one direction to stably hold against a biasing force of said snap spring in said one direction said first lens in a position where an optical axis of said first lens aligns with an optical path of said recording device; and second stop means for limiting swinging movement of said second lens arm in the opposite direction to stably hold against a biasing force of said snap spring in said opposite direction said second lens arm in a position where an optical axis of said second lens aligns with said optical path of said recording device.

4,573,781

VIEWFINDER HAVING TWO IMAGE PLANES

Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,968
Claims priority, application Japan, Sep. 29, 1983, 58-150805
Int. Cl.[4] G03B *3/00, 13/06*
U.S. Cl. 354—201 **5 Claims**



1. A viewfinder for observation through a photographic lens of a camera comprising:

optical path splitting means for splitting an optical path of the photographic lens on the image side of said photographic lens;

light conducting means for conducting light through an even number of reflections of at least four, including reflections by said optical path splitting means;

lens units arranged to sandwich a reflective surface at which at least one of said reflections occur and to cooperate with each other to relay an image formed by the photographic lens; and

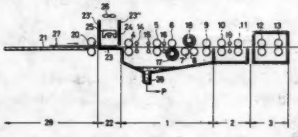
an eyepiece for observing the relayed image.

4,573,782

DEVELOPING APPARATUS FOR FORMING AN IMAGE IN LIGHT-SENSITIVE MATERIAL USING PHOTOPOLYMERIZABLE COMPOSITION

Kesanao Kobayashi; Tadao Toyama, and Susumu Yoshida, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1982, Ser. No. 444,142
Claims priority, application Japan, Nov. 24, 1981, 56-188246
Int. Cl.[4] G03D *3/08*
U.S. Cl. 354—299 **15 Claims**



1. An apparatus for developing light-sensitive material carrying a light-sensitive layer composed of a photopolymerizable composition, comprising:

a roller convey type developing unit and a heating unit;

said heating unit comprising a means for carrying out a first step of developing;

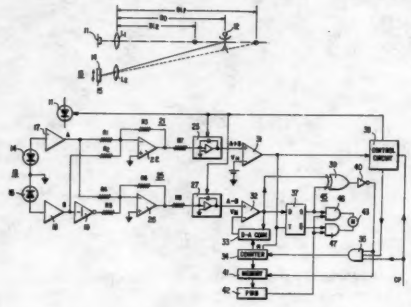
said heating unit, after said light-sensitive material carrying a light-sensitive layer composed of a photopolymerizable composition has been exposed imagewise to light, provides means to heat said light-sensitive material to further sensitize said light-sensitive material;

wherein after said light-sensitive material is heated to further sensitize said light-sensitive material in said heating unit said light-sensitive material is sent to said roller convey type developing unit in a predetermined period of time.

4,573,783
FOCUSING CONTROLLING DEVICE

Takashi Maruyama, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Nov. 18, 1983, Ser. No. 553,043
Claims priority, application Japan, Dec. 1, 1982, 57-210889
Int. Cl.[4] G03B 3/10
U.S. Cl. 354—403 6 Claims



5. A focusing controlling system for a camera which comprises:

a. a stationary light emitting element which sends a beam of light to an object in the field of view of the camera to be reflected thereby;

b. a movable light receiving element for receiving the reflected beam of light with said receiving element being ganged together with the camera lens for movement therewith, so that said light receiving element moves on a line perpendicular to the optical axis of the camera when the camera lens is extended along the optical axis;

c. said light receiving element comprising two aligned, adjacent photodetectors A and B;

d. said light receiving element and the camera lens are so adjusted that when the camera is in focus the light beam reflected from said object will impinge equally on the photo detectors A and B, and when the focal point is in front of the object, A will receive more light than B, and vice versa when the focal point is behind the object;

e. a processing circuit for the reflected light signals which comprises:

1. an adder for signals received by A and B providing the sum signal A+B;

2. a subtractor for signals received by A and B providing the difference signal A−B;

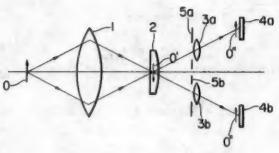
3. first and second pulsed integrators which provide integrated sum signals and integrated difference signals, respectively;

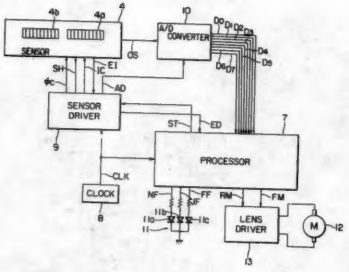
4. said integrated sum and difference signals providing inputs to a control circuit which controls the direction and amount of movement of a motor which moves the camera lens and the light receiving element, said movement continuing until the received signals A and B are equal, at which time the camera will be in focus, said control circuit comprising a first comparator which compares the integrated A+B signal with a predetermined value; a second comparator which compares the integrated A−B signal with a variable threshold; a counter with pulses applied thereto for counting, a reset signal which is provided by the output of the first comparator, and an output which represents the variable threshold for the second comparator; said counter continuing to count pulses until the variable threshold equals the integrated A−B signal, the count at this time representing the amount of extension of the camera lens.

4,573,784
FOCUS DETECTING APPARATUS

Kenji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 558,005, Dec. 5, 1983, abandoned. This application May 30, 1985, Ser. No. 739,496
Claims priority, application Japan, Dec. 11, 1982, 57-217467; Dec. 11, 1982, 57-217469
Int. Cl.[4] G03B 3/00
U.S. Cl. 354—406 10 Claims





1. A focus detecting apparatus including:

(a) optical means;

(b) sensing means for sensing radiation distribution for forming an image formed by said optical means, said radiation distribution being formed from two image rays separated through different exit pupils of said optical means, and said sensing means comprising a first photosensitive array which forms electric signals corresponding to a radiation distribution formed by one of said image rays, and a second photo-sensitive array which forms electric signals corresponding to a radiation distribution formed by the other image ray; and

(c) discriminating means for effecting a detection operation of the focus state of said optical means, said discriminating means having:

(i) a first mode in which said discriminating means selects a smaller number of signals than the number of elements forming said first and second arrays, to detect the focus state on the basis of the selected signals from each array when the amount of defocus is over a predetermined value, said selected signals being output from elements from each of said first and second arrays; and

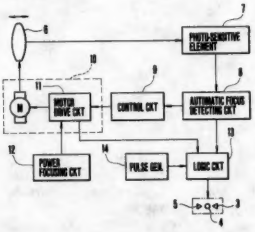
(ii) a second mode in which said discriminating means detects the focus state on the basis of the signals output from all the elements in said first and second arrays.

4,573,785

DISPLAY DEVICE FOR FOCUS DETECTING CAMERA

Kazuhiko Arakawa, Ohmorini, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,706
Claims priority, application Japan, May 9, 1983, 58-69034
Int. Cl.[4] G03B *13/18*
U.S. Cl. 354—409 27 Claims



1. A focus detecting device for a camera comprising:

(a) focal point detecting means arranged to be in a focal point detectable state in which said detecting means is capable of detecting whether an object to be photographed is located in a near-focus, in-focus or far-focus position relative to the focal point of a photo-taking lens and to be in a focal point undetectable state in which said focus position is undetectable;

(b) focal point display means for displaying a focal point on the basis of a detection signal produced by said focal point detecting means representing a near-focus, in-focus or far-focus position when said focal point detecting means is in said focal point detectable state;

(c) photo-taking lens drive direction detecting means for detecting a lens drawing-in or drawing-out direction in which the photo-taking lens is being driven; and

(d) photo-taking lens driving direction display means for producing a display which varies with the photo-taking lens drawing-out or drawing-in driving direction according to the direction output of said photo-taking lens driving direction detecting means and which also differs from the manner of display of said focal point display means at least when said focal point detecting means is incapable of performing focal point detection.

4,573,786

FLASH PHOTOGRAPHING SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Hiroshi Hosomizu, Nara; Kenji Tsuji, Kashiwara; Takanobu Omaki, Sennan, and Masaaki Nakai, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1984, Ser. No. 614,031
Claims priority, application Japan, May 27, 1983, 58-94605; Jun. 1, 1983, 58-98227; Jun. 4, 1983, 58-100050; Jun. 7, 1983, 58-102407; Jun. 10, 1983, 58-104650; Jun. 13, 1983, 58-106424; Jun. 15, 1983, 58-108484; Jun. 17, 1983, 58-109921; Jun. 18, 1983, 58-109854; Jun. 21, 1983, 58-112326; Jun. 23, 1983, 58-113920; Jun. 23, 1983, 58-113921; Mar. 13, 1984, 59-48435
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—416 60 Claims

1. In a flash photographing system including a combination of a camera, a controlling device connectable to the camera, a first electronic flash device connectable to the controlling device and a second electronic flash device directly connectable to the camera, the combination comprising:

first to third terminals included in the first electronic flash device;

first to third terminals included in the second electronic flash device;

fourth to sixth terminals included in the controlling device connectable with said first to third terminals of the first electronic flash device, respectively;

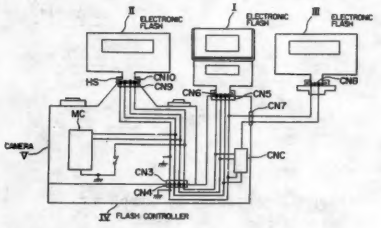
seventh to ninth terminals included in the controlling device;

tenth to twelfth terminals included in the camera connectable with said seventh to ninth terminals of the controlling device, respectively;

thirteenth to fifteenth terminals included in the camera connected to said tenth to twelfth terminals, respectively, and connectable with said first to third terminals of the second electronic flash device, respectively;

wherein, each of the first and second electronic flash devices includes means for initiating flash light emission in response to a flash initiating signal received through said first terminal, means for providing a light measurement controlling signal through said second terminal, means for serially forwarding data descriptive of electronic flash device conditions through said second terminal in response to a train of clock pulses received from said third terminal, means for serially receiving information from said second terminal in response to the train of clock pulses for operation of the electronic flash device, means for governing the mutual communication through said second terminal with a device connected thereto in response to a communication controlling signal received from said third terminal, and means for terminating flash light emission in response to a flash terminating signal received through said third terminal;

wherein the controlling device includes first means for transmitting the flash initiating signal from said seventh terminal to said fourth terminal, second means for transmitting the



light measurement controlling signal from said fifth terminal to said eighth terminal, third means for transmitting information from said eighth terminal to said fifth terminal, fourth means for transmitting the clock pulses, the communication controlling signal and the flash terminating signal from said ninth terminal to said sixth terminal, means for serially receiving the data of the first electronic flash device through said fifth terminal and the data of the second electronic flash device through said eighth terminal in response to the clock pulses received through said ninth terminal, means for determining the manner of flash light emission of the first and second electronic flash devices in accordance with said data receiving means, means for serially forwarding information representative of the manner of flash light emission to the first electronic flash device through said fifth terminal and to the second electronic flash device through said eighth terminal, respectively, in response to the clock pulses received through said ninth terminal, means for appreciating the total conditions of the first and second electronic flash devices in accordance with said data receiving means, means for serially informing the camera of the appreciated total conditions of the first and second electronic flash devices through said eighth terminal in response to the clock pulses received through said ninth terminal, and means for governing the mutual communication with the first electronic flash device through said fifth terminal and with the camera through said eighth terminal in response to the communication controlling signal received from said ninth terminal; and

wherein the camera includes first means connected to said

tenth terminal for producing the flash initiating signal, second means connected to said twelfth terminal for producing the train of clock pulses, third means connected to said twelfth terminal for producing the communication controlling signal, means for measuring light in response to the light measurement controlling signal received through said eleventh terminal to produce the flash terminating signal through said twelfth terminal, fourth means connected to said eleventh terminal for producing information to be transmitted to the first and second electronic flash devices, and means connected to said eleventh terminal for receiving the appreciated total conditions of the first and second electronic flash devices.

4,573,787

EXPOSURE LAMP CONTROL FOR IMAGE FORMING APPARATUS

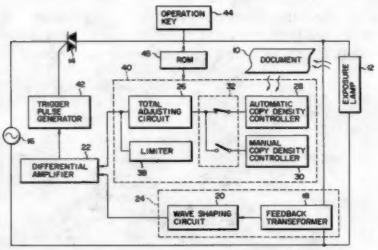
Takeshi Sanbayashi, Tokyo, and Hideshi Oushiden, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1984, Ser. No. 628,983

Claims priority, application Japan, Jul. 11, 1983, 58-125945

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 E **8 Claims**



1. An image forming apparatus comprising:

lamp means for exposing a document;

magnification setting means for generating a magnification signal;

means, connected to said magnification setting means, for forming an image of the document on a recording medium based on a light from the exposed document, a size of the image being determined by the magnification signal;

memory means, connected to said magnification setting means, which stores digital data corresponding to various magnifications and produces the digital data in response to the magnification signal; and

lamp control means, connected to said lamp means and memory means, for applying a power voltage to said lamp means in accordance with the digital data generated from said memory means.

4,573,788

IMAGE FORMING DEVICE

Nao Nagashima, Tokyo; Koji Suzuki, Yokohama; Jyoji Nagahira, Tokyo; Kouki Kuroda, Yokohama, and Yoshiaki Takayanagi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 284,138, Jul. 16, 1981, abandoned. This application Oct. 15, 1984, Ser. No. 661,117

Claims priority, application Japan, Jul. 22, 1980, 55-100087; Jul. 23, 1980, 55-101657; Jul. 24, 1980, 55-101504

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **41 Claims**

1. An image forming device, comprising:

image forming means for forming an image on a recording member;

detecting means for detecting a value corresponding to an operating condition of said image formation;

memory means storing instructions for the control of said image forming means so as to regulate image quality, said instructions defining a plurality of control programs providing different modes of control over said condition of the image forming means in accordance with the detected value; and

means for selecting between said plurality of programs and for causing the selected program to be executed.

4,573,789

DUPLEX COPYING SYSTEM

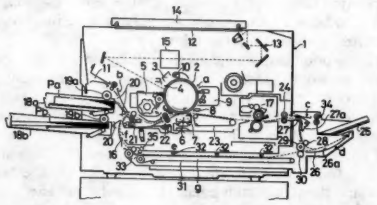
Kenichi Wada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1983, Ser. No. 484,577

Claims priority, application Japan, Apr. 13, 1982, 57-62085; Apr. 16, 1982, 57-64442; Apr. 16, 1982, 57-64443; Apr. 19, 1982, 57-65628; Apr. 21, 1982, 57-67924

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **12 Claims**



1. A duplex copying mechanism comprising:

a copying means having a sheet feed station, an image formation station for forming an image of an original on one side of a copy sheet feed from said sheet feed station, and a sheet discharge station from which a copied sheet passed through said image formation station is discharged; and

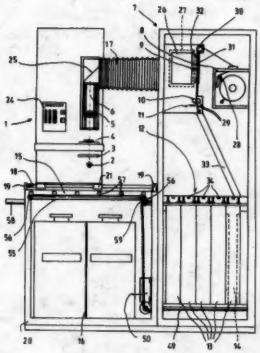
a duplex copying auxiliary means for returning said copied sheet to said image formation station with the sheet thereof in a turned over state, said auxiliary means including a changeover gate station for effecting changeover of the transfer direction of sheet to said sheet discharge station as well as said auxiliary means itself, a switchback station for changing the feeding end for the trailing end of the sheet received therein, a return feed station for feeding the copied sheet from the switchback station toward the image formation side, a reversing station for feeding the copied sheet to the image formation station with the copied sheet being reversed, and means for driving said auxiliary means at a speed which is set lower than that of said sheet feed station of the copying means and at which the upside copied sheet is returned by the auxiliary means, whereby the upside copied sheets copied continuously by the copying means are returned to said image formation station with the sheets overlapping each other in staggered relation due to said speed difference during their return to said image station, and the underside copied sheets retained on said return feed station are successively fed to the image formation station through said reversing station for continuous underside copying operation when the foremost one of the underside copied sheets has reached the specified position in the return feed station.

4,573,790

AUTOMATIC DEVELOPER/PRINTER APPARATUS FOR OBTAINING PHOTOGRAPHIC PRINTS FROM A NEGATIVE

Michel Ducos, Ramonville St Agne, France, assignor to Sarl Photosysteme, Escalquens, France

Filed Mar. 20, 1984, Ser. No. 591,452
Claims priority, application France, Mar. 24, 1983, 83 05014
Int. Cl.[4] G03B *29/00*
U.S. Cl. 355—28 26 Claims



1. An automatic developer/printer apparatus for obtaining photographic prints from a developed negative comprising:

(a) a projection assembly means for projecting light through a developed negative comprising a negative carrier and an optical apparatus wherein said optical apparatus is displaceable perpendicular to the surface of said negative;

(b) an exposure darkroom means comprising photosensitive material, wherein said exposure darkroom means exposes said photosensitive material to said light projected through said negative and said optical apparatus wherein said darkroom means further comprises a projection plane comprising means for receiving light projected through said negative and said optical apparatus wherein the entire projection assembly means is displaceable perpendicular to said projection plane;

(c) a developing means for developing said photosensitive material exposed to said light projected through said negative; and

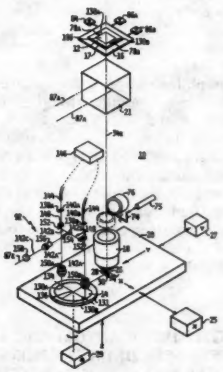
(d) a housing wherein said housing comprises a drying chamber for drying said exposed and developed photosensitive material and a treatment product reservoir for storing excess treatment product, wherein said projection assembly means is positioned parallel and adjacent to said exposure darkroom means, said exposure darkroom means is positioned above said developing means, said developing means is positioned parallel and adjacent to said housing, and said housing is positioned under said projection assembly means wherein said projection assembly means, said exposure darkroom means, said developing means and said housing comprise separate elements having separate outer walls, wherein said apparatus further comprises means for displacing said optical apparatus and said projection assembly means in synchronism so as to obtain an enlarged and focused image projected on said projection plane.

4,573,791

STEP-AND-REPEAT PROJECTION ALIGNMENT AND EXPOSURE SYSTEM

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Division of Ser. No. 396,099, Jul. 7, 1982, Pat. No. 4,473,293, which is a continuation of Ser. No. 26,722, Apr. 3, 1979, abandoned. This application Sep. 12, 1984, Ser. No. 649,767
Int. Cl.[4] G03B *27/32, 27/42*
U.S. Cl. 355—77 8 Claims



1. A method for aligning first and second relatively-moveable objects with respect to one another, said method comprising the steps of:

supporting each of the first and second objects for independent movement along coordinate first and second axes and about a coordinate third axis;

aligning the first object with respect to the coordinate first and second axes; and

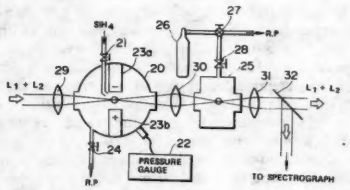
aligning the second object with respect to the coordinate first and second axes and, hence, with respect to the first object.

4,573,792

METHOD OF AND APPARATUS FOR QUANTITATIVE ANALYSIS IN ACCORDANCE WITH CARS

Koichi Kajiyama, Hiratsuka; Norio Moro, Yamato; Kazuaki Sajiki, Fujisawa, and Tadayoshi Yamaguchi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,482
Claims priority, application Japan, Mar. 31, 1982, 57-54627; Jul. 9, 1982, 57-119636
Int. Cl.[4] G01J *3/44;* G01N *21/65*
U.S. Cl. 356—301 5 Claims



5. An apparatus for performing quantitative analysis using CARS comprising:

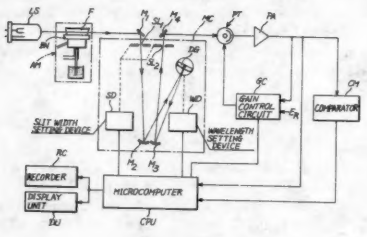
(a) a first laser means for generating laser light of a first frequency;
(b) a second laser means for generating laser light of a predetermined frequency bandwidth;
(c) optical means for forming a simple laser beam from said laser light of a first frequency and said laser light of a predetermined frequency bandwidth;
(d) a first transparent cell filled with a first material of unknown concentration and having a first Stokes frequency lying within said predetermined bandwidth;
(e) a second transparent cell filled with a second material of known concentration and having a second Stokes frequency lying within said predetermined bandwidth, said second transparent cell being disposed in series with said first first transparent cell along the optical path of said single laser beam;
(f) a spectrograph for recording the spectrum of said single laser beam following passage through said first and second transparent cells; and
(g) a multi-channel detector for detecting the intensity of anti-Stokes light produced upon passage of said laser beam through said transparent cells at every wavelength of a spectrum, wherein the concentration of said first material can be calculated from the ratio of the intensity of the anti-Stokes light corresponding to said first material to the intensity of the anti-Stokes light corresponding to said second material.

4,573,793

SPECTROPHOTOMETER AUTOMATIC ADJUSTMENT FOR DIFFERENCES BETWEEN NOMINAL AND ACTUAL WAVELENGTH SETTINGS

Kikuo Sasaki, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Dec. 23, 1983, Ser. No. 564,889
Claims priority, application Japan, Dec. 30, 1982, 57-228244
Int. Cl.[4] G01J *3/18, 3/04*
U.S. Cl. 356—326 **6 Claims**



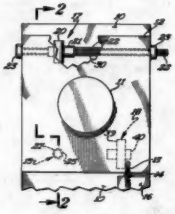
1. A spectrophotometer comprising:
(a) a light source means for providing a beam of light having an emission line spectrum;
(b) a monochromator comprising an entrance slit through which said beam of light enters said monochromator, a dispersing means for dispersing said beam of light into a series of wavelengths, an exit slit through which a monochromatic light of a selected one of said wavelengths emerges from said monochromater, a slit width setting means for setting said entrance and exit slits to a same variable width, and a wavelength setting means for setting said dispersing element to such a position as to provide a monochromatic light, corresponding to said position, of one of said series of wavelengths at said exit slit;
(c) a light measuring means for measuring the intensity of said monochromatic light at said exit slit and producing a corresponding electrical output signal; and
(d) a control means for controlling said slit width setting means and said wavelength setting means in such a sequential manner that in a wavelength setting mode said dispersing means is set to a position of a designated wavelength, and said slits are widened to a predetermined width so as to measure a beam of light having a spectrum with an emission line at said designated wavelength, and for controlling sensitivity adjusting of said light measuring means so that said output signal is kept at a predetermined constant level, and then said slits are narrowed, whereupon said dispersing means is operated such that wavelength scanning is conducted over a range of wavelengths including said designated wavelength so as to detect a peak in said emission line spectrum, and then said dispersing means is set to said peak position.

4,573,794

ANALYTICAL INSTRUMENT OPTICAL ELEMENT SUPPORT SYSTEM

Joel P. Covey, and Allen J. Zerbel, both of Madison, Wis.

Filed Mar. 3, 1983, Ser. No. 471,733
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 **14 Claims**



1. In an analytical instrument of the type having a source of analytical radiation and having optical elements for directing said radiation through said instrument, an improved system for supporting and spatially orienting an optical element carried by a support plate which comprises:
planar base means secured within said instrument;
means carried by said base means for spacing one support plate portion from said base means while allowing a spatial reorientation of said support plate around said support plate portion;
first and second point contact means adjustably spacing different support plate portions from said base means, each of said first and second point contact means comprising generally cylindrical means and generally conical means having their major axes non-parallel and contacting each other at a point at their periphery with at least one of said cylindrical means and conical means being movable relative to the other; and
means resiliently biasing said base means and support plate toward each other.

4,573,795

ROTATION RATE MEASURING INSTRUMENT

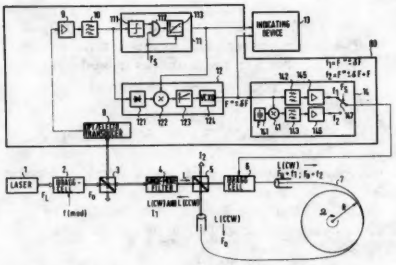
Wilfried Auch, Asperg; Friedemann Mohr, Renningen; Eberhard Schlemper, Vaihingen, and Walter Steudle, Schlaitdorf, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,510
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136688
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—350 **11 Claims**

1. An instrument based on Sagnac effect for measuring the rotation rate of a mechanical member comprising:
a closed light path of substantially constant radius circumferentially disposed about a rotating circle having a center coincident with the center of rotation of said mechanical member;

means for generating a coherent light beam, and means for splitting said light beam into two separate light beams for propagation through said closed light path one split beam into a clockwise direction and the other split beam in a counterclockwise direction;

means for frequency modulating one of said split light beams with cyclically alternating first and second modulation frequencies, said one split light beam thereby having a phase shift ϕ_{B1} introduced as a separately identifiable characteristic;



means for superimposing said two light beams in a return light beam from said closed light path, said return light beam having components of intensities $\cos^2(\phi s/2)$ and $\sin^2(\phi s/2)$, where ϕs is a phase shift between said two light beams due to said Sagnac effect that is proportional to rate of rotation; and

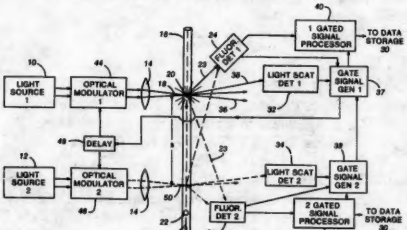
means for measuring the differential phase shift ϕ between the light signals of said two beams after passage through said light path where $\phi = \phi s + \phi_{B1}$ as a measurement of the angular velocity of said mechanical member.

4,573,796

APPARATUS FOR ELIMINATING BACKGROUND INTERFERENCE IN FLUORESCENCE MEASUREMENTS

John C. Martin, and James H. Jett, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1984, Ser. No. 568,768
Int. Cl.[4] G01J *3/42*; G01N *21/64*
U.S. Cl. 356—318 **14 Claims**



1. In a flow cytometer measuring device having first and second light sources for forming respective first and second beams of focused light to excite different fluorescent dyes bound to specific components of biological particles, the measuring device including a fluorescence detector for producing fluorescence data, and a data storage system for storing said fluorescence data, the improvement comprising an apparatus for modulating on and off light from a light source to eliminate background interference from one light source while the other light source excites the biological particle and the resulting fluorescence is detected, said apparatus including:

a. first and second light scatter detectors for detecting light scattered by biological particles:

b. first and second gate signal generators for generating first and second gate signals, said first gate signal generator being responsive to said first light scatter detector and said second gate signal generator being responsive to said second light scatter detector;

c. first and second gated signal processing means for receiving said first and second gate signals respectively and for transmitting the fluorescence data to the data storage system, said first gated signal processing means being connected to said first gate signal generator, the fluorescence detector and the data storage system, said second gated signal processing means being connected to said second gate signal generator, the fluorescence detector and the data storage system;

d. delay means for delaying said gate signal generated by one of said gate signal generators, said delay means being connected to receive said gate signal and producing a delayed gate signal in response thereto; and

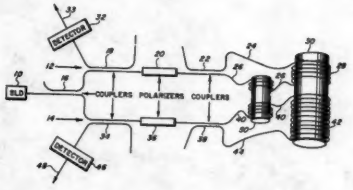
e. an optical modulator associated with one of the light sources, said optical modulator being connected to said delay means to receive said delayed gate signal and modulate on and off the light from the light source in response thereto.

4,573,797

ANALOG FIBER GYRO WITH EXTENDED LINEAR RANGE

William K. Burns, Alexandria, Va., and Robert P. Moeller, Fort Washington, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1984, Ser. No. 583,549
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **31 Claims**



1. An extended linear dynamic range fiber optic gyroscope system with a gyroscope system output comprising:

a fiber optic first gyroscope disposed on a platform for obtaining a linear output for a first range of platform rotation rates, and including a fiber optic interofermeter coil wherein light is introduced into said first coil for propagating therearound in mutually opposite directions to emerge therefrom for detection of the relative phase shift induced by rotation of said platform, said first gyroscope further including a first detector and demodulator for providing a quantity proportional to said relative phase shift, said first coil having a first axis and being described by a first quantity L_1R_1/λ_1, where L_1 and R_1 are the length and radius, respectively, of the first coil, and λ_1 is the wavelength of the light propagating therein, said first quantity providing said linear gyroscope output at said detector and demodulator for said first range of platform rotation rates;

a second fiber optic gyroscope disposed on said platform for obtaining a linear output for a second range of platform rotation rates, which range partially overlaps said first

range, and including a second fiber optic interferometer coil, wherein light is introduced into said second coil for counter propagating therearound in mutually opposite directions to emerge therefrom for detection of the relative phase shift induced by the rotation of said platform, said second gyroscope further including a second detector and demodulator for providing a quantity proportional to said relative phase shift, said second coil having a second axis which is parallel to said first axis and being described by a second quantity L_2R_2/λ_2, where L_2 and R_2 are the length and radius, respectively, for said second coil, and λ_2 is the wavelength of the light propagating in said second coil, said second quantity providing said linear gyroscope output for said second range of platform rotation rates;

means for comparing at least one of the detector outputs to a reference value equal to a gyroscope output value within the overlap between said first and second ranges and generating a control signal in accordance therewith; and

a switching circuit for switching one or the other of the detector and demodulator outputs of the gyroscope system output in accordance with said control signal so that the gyroscope which is operating within its linear range is utilized.

4,573,798

METHOD AND APPARATUS FOR MEASURING PATTERN AREA PERCENTAGE FOR ENGRAVING FILMS

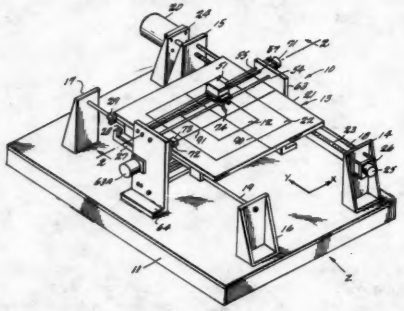
Hideo Fujie, Shizuoka, and Kousaku Togashi, Yokohama, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 408,128

Claims priority, application Japan, Sep. 16, 1981, 56-145845; Sep. 16, 1981, 56-145844

Int. Cl.⁴ G01B *11/28*

U.S. Cl. 356—432 **4 Claims**



1. Apparatus for measuring pattern area percentages of each of a plurality of columns into which a plurality of engraving films having a matter to be printed on a printing plate are divided, said columns corresponding to the spacing of ink supply adjusting keys of a printing machine comprising:

a base;

a stage slidably mounted on said base for movement in a direction Y;

a transparent member mounted on said stage for receiving one of said plurality of films thereon;

optical means mounted on said base for movement in a direction X perpendicular to said direction Y including a light source mounted on one side of said transparent member, a single light detector mounted on the other side of said transparent member facing said light source to produce an output, means between said source and detector defining a rectangular measuring area through which light passes from said source to said detector, and means for adjusting the width of said rectangular area;

means for driving said stage and said optical means respectively in said Y and X directions; and

control means including means for storing data relating to the number and spacing of the ink supply adjusting keys of the printing machine, the size of the engraving film and the printing position of the film on the printing plate and microprocessor means for determining the divisions of the columns to be measured on said film in accordance with the stored data, producing control signals for adjusting the width of said rectangular area in accordance with the determined divisions, producing drive signals for said drive means and calculating the pattern area percentages of each column from the output of said light detector.

4,573,799

DEGASSING EXTRUSION DEVICE

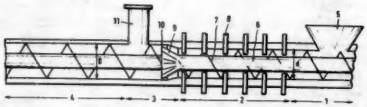
Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,710

Claims priority, application 08261982, Aug. 26, 1982, 82107840

Int. Cl.⁴ B30B *11/22, 11/24*

U.S. Cl. 366—89 **5 Claims**



1. A degassing extrusion device suitable for extruding thermoplastic materials and rubber comprising a hollow cylinder, worm means extending axially within said hollow cylinder, said interior of said hollow cylinder defining a plurality of treatment regions, said treatment regions comprising a feed region for receiving material to be treated, a pin region downstream of and in communication with said feed region and having pins located therein which extend radially into the space between said cylinder and said worm so as to increase the pressure in said pin region, a degassing region downstream of an in communication with said pin region and a discharge region downstream of and in communication with said degassing region, wherein said degassing region is immediately downstream of said pin region and said hollow cylinder has a first diameter in said degassing and discharge regions and a second diameter in said pin region, said first diameter exceeding said second diameter.

4,573,800

BLENDER BULK FEED VALVE

Eugene R. Lasso, Freemansburg, and John J. Pitsko, Nazareth, both of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed Dec. 10, 1984, Ser. No. 680,213

Int. Cl.⁴ B01F *13/02*

U.S. Cl. 366—101 **9 Claims**

1. A pneumatic conveying and material blending system including a vertically oriented vessel having sidewalls, a bottom and a top and an inlet for solid particulate material in the bottom; a hollow, open-ended vertically oriented column mounted in said bin, spaced from and coaxially aligned with the inlet for material; means for supplying a stream of gaseous fluid and fresh solid particulate material to be blended to said inlet for flow upwardly through said column and for selectively entraining solid particulate material already in the vessel and conveying said fresh material and entrained material upwardly through the column whereby said fresh solid particulate material and solid particulate material already in the vessel which is entrained in the stream of gaseous fluid are dispersed

onto the top surface of material in the vessel to thereby blend the material; and means for controlling the quantity of material

already in the vessel which is entrained into the stream of fresh solid particulate material flowing upwardly through the column.

4,573,801

APPARATUS FOR PRODUCING A GAS SOLID TWO PHASE FLOW JET HAVING A CONSTANT MASS OR VOLUME FLOW RATE AND PREDETERMINED VELOCITY

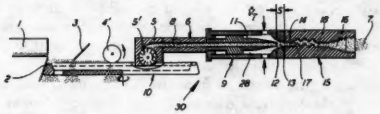
Kurt Leschonski, Am Dammgraben 20, and Stephan Röthele, Am Rollberg 5, both of 3392 Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,675

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307406

Int. Cl.⁴ B01F *15/02*

U.S. Cl. 366—154 **22 Claims**



1. A metering-dispersing apparatus for producing a gas-solid two phase flow jet having a constant flow rate and predetermined velocity, with the solids being fully and uniformly dispersed therein, comprising:

(a) means forming a metering groove which is rotatable about an axis, said metering groove having a cross section to establish a consolidated solid particle mass flow of constant cross section;

(b) metering means including a vibrating feeder chute having a dispensing location spaced above the metering groove for feeding solid particles to said metering groove;

(c) wiper means disposed downstream of the dispensing location of the metering groove as seen in the direction of rotation of said metering groove and at an adjustable distance from said metering groove for the selected removal of surplus solids;

(d) means for compressing the solids remaining in solid groove, after passing said wiper means, disposed downstream of said wiper means in the direction of rotation of said metering groove for uniformly and lightly compressing the solid particles in said metering groove; and

(e) a flow channel including:

(i) an injector having a suction mouth immersed in said metering groove downstream of said compressing means in the direction of rotation of said metering groove;

(ii) dispersing means following said injector and including a plurality of impact surfaces having a zig-zag outline within said flow channel arranged to be hit successively by the gas-solid particle mixture moving from said injector to said dispersing means; and

(iii) an outlet nozzle downstream of said plurality of impact surfaces.

4,573,802

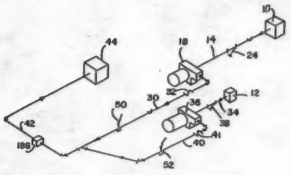
DEICING METHOD AND APPARATUS

Jerome J. Kerrigan, Northbrook, and Gregory E. Domanowski, Oak Park, both of Ill., assignors to F. J. Kerrigan Plumbing Co., Wilmette, Ill.

Filed Nov. 17, 1983, Ser. No. 552,831

Int. Cl.⁴ G05D *11/02;* **B01F** *15/04*

U.S. Cl. 366—152 **4 Claims**



1. Control circuitry including interlocking means for indicating a fault condition of the flow of a specific fluid, and a fluidic system adapted to selectively provide a first-fluid-only flow and a first- and second-fluid mixture-flow at desired output ports, said control circuitry comprising in combination, a system flow fault relay, a first fluid fault relay and a second fluid flow fault relay, each of said relays including a coil and indicating means, movable contacts, the coil of said system low fault relay being connected to contacts of said other two relay coils to be energized when the coil of either of said other two contacts is energized in response to a respective fluid flow fault, and each of said other two relay coils being connected respectively to be de-energized when the second of said other relay coils is energized to thereby allow only one indicating means to be energized at a time.

4,573,803

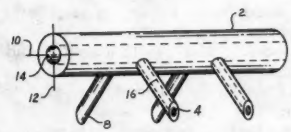
INJECTION NOZZLE

Gregory A. Gritters, Indio; Walter E. Nellis, Bermuda Dunes, and John L. Featherstone, El Centro, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 15, 1984, Ser. No. 610,332

Int. Cl.⁴ B01F *5/04*

U.S. Cl. 366—167 **21 Claims**



1. A nozzle useful for injecting a corrosive fluid into a fluid stream comprising:

(a) a substantially straight tubular injector body having an axial bore therethrough; and

(b) at least two pairs of substantially straight injection tubes having axial bores therethrough fluid tightly connected to the axial bore of the injector body, the injection tubes of each pair proceeding radially from, and in the same plane normal to, the axis of the injector body, and with each of the injection tubes lying in one of two planes containing

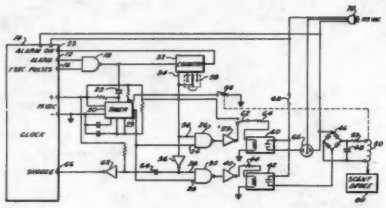
the axis of the injector body, which injection tubes cut a third plane parallel to the axial bore of the injector body.

4,573,804

SCENT-AWAKE ELECTRONIC CLOCK

James P. Kavoussi, 1401 - 80th St., Brooklyn, N.Y. 11228, and Louise D. Hartford, 391 Durant Ave., Staten Island, N.Y. 10308

Filed Apr. 8, 1985, Ser. No. 720,530
Int. Cl.[4] G04B 47/00
U.S. Cl. 368—12 2 Claims



1. A scent-awake electronic clock, comprising in combination:

(a) an electronic clock having an alarm contact closure which is activated at a predetermined time, output clock pulses which occur at one second intervals, and a snooze input which, when triggered, deactivates said closure and reactivates said closure after a fixed period of time thereby permitting a snooze interval followed by another alarm contact closure;

(b) a first NAND gate;

(c) a second NAND gate;

(d) a third NAND gate;

(e) a timer circuit which is initiated when said alarm contact closure and said clock pulses are inputted to said first NAND gate; wherein said timer circuit output is inputted to said second NAND gate and said third NAND gate; wherein said timer circuit is reset at the end of every alarm period; whereby the duration of both a scent alarm and an external alarm are determined by said timer circuit's interval;

(f) a counter whose output is initiated when a predetermined number of said clock pulses has occurred, wherein said output is inputted to said second NAND gate and wherein said output is inverted and then inputted to said third NAND gate; whereby the interval of time between the initiation of a scent alarm and the initiation of a snooze time period may be selected by varying the modulus of said counter;

(g) said second NAND gate the output of which is inverted and inputted to a first relay;

(h) said first relay the output of which activates an external alarm;

(i) said third NAND gate the output of which is inverted and inputted to a second relay;

(j) said second relay the output of which activates a scent alarm;

(k) an inverter, with a series capacitor at its input which takes said inverted pulse from one input of said third NAND gate and couples a pulse to said snooze input when said counter is finished counting, thereby initiating said snooze period;

(l) said scent alarm which releases a scent during a first alarm period, and

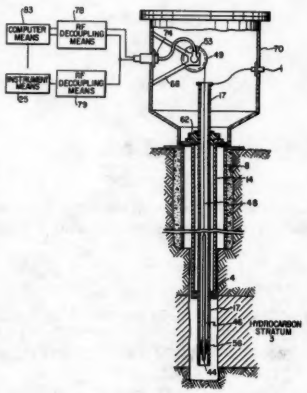
(m) an external alarm socket which is activated after said snooze interval during a snooze alarm period.

4,573,805

METHOD FOR MEASURING TEMPERATURE OF A HYDROCARBON STRATUM SUBJECTED TO RF ELECTROMAGNETIC ENERGY

Kerry D. Savage, and Donald J. Dowling, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,593
Int. Cl.[4] G01K 13/00; G01V 31/26
U.S. Cl. 374—136 11 Claims



1. In the RF retorting of a hydrocarbon stratum in an earth formation, traversed by a borehole with an applicator having a hollow inner conductor and an outer conductor, a method for measuring the temperature of the hydrocarbon stratum in the vicinity of the borehole which comprises the steps of:

sensing the temperatures at different positions within the inner conductor of the applicator in the vicinity of the hydrocarbon stratum with a plurality of thermocouple junctions with each thermocouple junction providing an electrical signal representative of the temperature sensed by the thermocouple junction,

conducting the electrical signal from the sensing positions to the surface of the earth with wires connecting each thermocouple junction and being brought up inside the inner conductor of the applicator to the surface;

decoupling an RF voltage from the conducted electrical signals by coiling the wires as a group so that each wire acquires an inductance, and connecting each wire after the coiling of the wires to ground through a capacitor so that a decoupled electrical signal appears at the connection of a wire and a capacitor, and

providing an indication of the temperature in accordance with the decoupled electrical signals.

4,573,806

THERMOCOUPLE ISOLATION BLOCK SYSTEM

M. Samuel Moore, Northridge, and Charles F. Paluka, Canoga Park, both of Calif., assignors to Semco Instruments, Inc., No. Hollywood, Calif.

Filed May 2, 1985, Ser. No. 729,544
Int. Cl.[4] G01K 1/08, 1/14
U.S. Cl. 374—144 13 Claims

1. An engine temperature monitoring system for aircraft engines, comprising:

at least one aircraft engine;

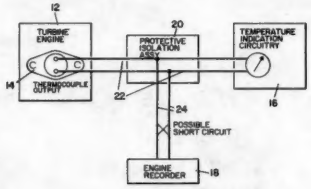
thermocouple means for sensing the operating temperature at one or more selected points of said aircraft engine and producing temperature varying signals at a first pair of terminals;

a first aircraft circuit coupled to receive signals from said thermocouple means at said terminals;

a thermocouple output isolation assembly means connected to said pair of terminals for receiving and transmitting thermocouple signals from said pair of terminals;

a second aircraft circuit requiring temperature signals coupled to said isolation assembly; and

said isolation assembly including a pair of input buses for securing to said first pairs of terminals, a housing, a pair of output terminals securely mounted on said housing, a pair



of resistors mounted within said housing and connecting said input buses to said output terminals, and high temperature insulation material surrounding said resistors and spacing said output terminals from said housing;

whereby any possible short circuit in the connections from said isolation assembly output terminals to said second aircraft circuit would have minimal effect on the temperature signals received by said first aircraft circuit.

4,573,807

FLUID BEARING DEVICE

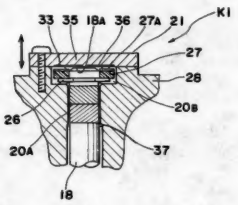
Takafumi Asada, Hirakata; Churyo Yoshida, Amagasaki; Minoru Koda, Yawata, and Hideaki Ohno, Sennan, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Jan. 29, 1985, Ser. No. 696,244

Claims priority, application Japan, Jan. 31, 1984, 59-16551

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—100 **12 Claims**



1. A fluid bearing device comprising:

a shaft;

a sleeve which is rotatably supported by said shaft;

a thrust bearing plate which is supported by said sleeve such that one face of said thrust bearing plate is brought into contact with one end face of said shaft;

a radial groove for producing a dynamic pressure, which is formed on at least one of an outer periphery of said shaft and an inner periphery of said sleeve; and

a spiral groove which is formed on at least one of said end face of said shaft and said face of said thrust bearing plate;

said radial groove retaining therein oil, while said spiral groove retains therein grease containing base oil and thickener, with said base oil being identical, in compositions and viscosity, with said oil retained in said radial groove.

4,573,808

PNEUMATIC JOURNAL BEARING

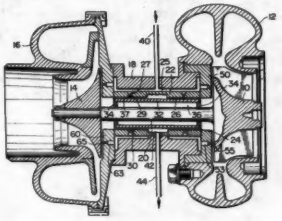
Kaoru Katayama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jan. 23, 1985, Ser. No. 694,005

Claims priority, application Japan, Feb. 10, 1984, 59-24085

Int. Cl.⁴ F16C *32/06, 37/00*

U.S. Cl. 384—114 **5 Claims**



1. A pneumatic journal bearing comprising:

a generally cylindrical bearing body having a cylindrical bearing surface on the inner side:

a rotatable torque or power transmitting shaft which has an outer diameter substantially smaller than the diameter of said cylindrical bearing surface and extends coaxially through the cylindrical space defined by said bearing;

a cylindrical journal member which comprises a hollow cylinder having an inner diameter substantially larger than the outer diameter of said shaft and an outer diameter slightly smaller than the diameter of said bearing surface and two end plates each of which is a disk tightly fitted into an endmost section of the cylindrical journal member, has an opening through which said shaft extends, and is fixed to both said shaft and said hollow cylinder such that said hollow cylinder is held coaxial with and spaced from said shaft so as to define a cross-sectionally annular space around said shaft and so as to leave a clearance space of a predetermined width between the outer surface thereof and said bearing surface; and

gas passage means for introducing a pressurized gas into said clearance space, whereby said journal member from said shaft prevents change in the width of said clearance space when said said shaft is heated to a high temperature.

4,573,809

SHAFT MOUNTING

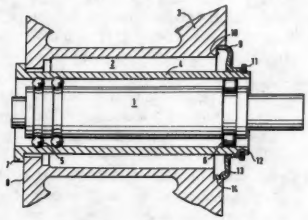
Werner Jacob, Frankfurt, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,629

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340857

Int. Cl.⁴ F16C *19/49, 27/00*

U.S. Cl. 384—493 **8 Claims**



1. An antifriction bearing arrangement for rotatably mounting a shaft in a bore of a housing, the said antifriction bearing

arrangement in addition to the shaft comprising a sleeve receiving two antifriction bearings mounted therein at a distance from each other for supporting the shaft, the sleeve being arranged in the bore of the housing which has a higher coefficient of thermal expansion than the parts of the antifriction bearing arrangement and being provided with a radially outwardly directed flange which by elastic spring means is pressed against a contact surface of the housing traversed by the bore and thereby frictionally fixed in the radial direction in relation to the contact surface, characterized in that the sleeve and the housing are axially braced by the said elastic spring means which preferably yield axially, abut a housing surface plane parallel to the contact surface and radially support the sleeve at its end remote from the flange in relation to the housing.

4,573,810

SELF-PUMPING HYDRODYNAMIC BEARING

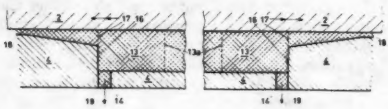
Armin Fust, Gebenstorf, and Mihailo Starcevic, Mellingen, both of Switzerland, assignors to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Aug. 15, 1984, Ser. No. 640,840

Claims priority, application Switzerland, Aug. 31, 1983, 4776/83

Int. Cl.⁴ F16C *1/24, 3/14, 32/06*

U.S. Cl. 384—322 **17 Claims**



7. A self-pumping hydrodynamic bearing comprising:

(a) at least one stationary component having a sliding surface;

(b) a moving component which slides on the sliding surface of said at least one stationary component and which is separated from the sliding surface of said at least one stationary component by a lubrication gap through which lubricant flows during use of the self-pumping hydrodynamic bearing; and

(c) a lubricant discharge duct;

(d) the sliding surface of said at least one stationary component being sized, shaped, and positioned relative to said moving component to provide a pumping gap therebetween through which, during the use of the self-pumping hydrodynamic bearing, lubricant is forced in the direction of motion of said moving component;

(e) said pumping gap being bounded a constriction which divides the flow of lubricant into at least two branches, at least one of which continues into said lubrication gap and at least one of which enters said lubricant discharge duct;

(f) said constriction comprising:

(i) an abrupt shoulder at the downstream boundary of said pumping gap, the working surface of said abrupt shoulder being at least generally perpendicular to the flow of the lubricant through said pumping gap, and

(ii) a gradually inclined ramp connecting said abrupt shoulder to said lubrication gap.

4,573,811

CENTER-FREE LARGE ROLLING BEARING

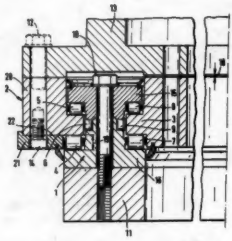
Dietrich Andree, and Walter Creutz, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,360

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413286

Int. Cl.⁴ F16C *19/30*

U.S. Cl. 384—622 **7 Claims**



1. A centre-free large rolling bearing in double constructional form having three bearing races (1, 2, 3), two of which are rotatable independently of each other and with respect to the third, and arranged therebetween rolling element rows (4, 5, 6, 7, 8, 9) for rotational connection of two components (11, 13), a centre race (1) being fixedly connectable to a first component (11) and an outer race (2) or an inner race (3) being fixedly connectable to a second component (13), characterized in that the centre race (1) consists of a plurality of sub-races (15, 16), that the outer race (2) connected to the second component (13) likewise consists of a plurality of sub-races (20, 21) and a parting line (22) of said outer race is disposed substantially at the same level as the rolling element row (4), bearing the supported load, of said outer race, and that the inner race (3) not connected to the second component (13) has a spacing (18) from the component (13) which is less than the height (19) of the rolling element row (4), bearing the supported load, of the connected outer race (2).

4,573,812

INTERCHARACTER SPACE PROCESSING APPARATUS FOR PRINTERS

Yoshihisa Kondo, Iwate, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 28, 1984, Ser. No. 655,938

Claims priority, application Japan, Sep. 29, 1983, 58-181504

Int. Cl.⁴ B41J *19/32*

U.S. Cl. 400—121 **2 Claims**

1. An intercharacter space processing apparatus for use in a printer, comprising:

(a) a receiver for receiving print code signals;

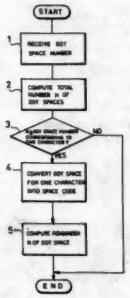
(b) a memory for storing character codes received by said receiver;

(c) a dot space control unit responsive to an intercharacter dot space signal received by said receiver for inserting an intercharacter space code between character codes stored in said memory, so that the printer will print characters on a print surface based on information stored in said memory;

(d) first means for computing the total number of dot spaces of the intercharacter dot space area and producing a signal when the dot space area according to the intercharacter dot space signal is greater than a predetermined dot space area represented by a space character code; and

(e) second means responsive to said signal from said first means for converting the intercharacter dot space area into an intercharacter space code comprising one or more space

character codes and a remainder dot space area code, which is equal to the excess of the intercharacter dot space area



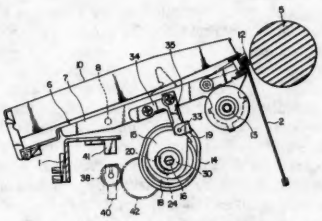
over the space character area, and storing said code into said memory.

4,573,813

RIBBON LIFT DEVICE FOR A PRINTER

Hideo Aoki, and Kazuaki Takahashi, both of Kodaira, Japan, assignors to Silver Seiko, Ltd., Japan

Filed Jan. 17, 1985, Ser. No. 692,244
Claims priority, application Japan, Jan. 17, 1984, 59-4867
Int. Cl.[4] B41J *35/22*
U.S. Cl. 400—214 **11 Claims**



1. A ribbon lift device for selectively moving a base member to position a print ribbon and a correction ribbon supported thereon to a print position to allow printing with said print ribbon or said correction ribbon, comprising:

a bidirectional drive motor;

a first cam coupled to be rotated by said drive motor and having a reference position for rotation;

said first cam having a cam groove formed on a face thereof;

a cam follower mounted on said base member and in engagement with said cam groove of said first cam;

said cam groove of said first cam having a first portion which moves, when said cam is rotated in a first direction from said reference position, said base member to position said print ribbon to said print position;

a second cam mounted for rotation relative to said first cam; and

coupling means for coupling said first cam to said second cam such that rotation of said first cam in a second direction opposite to said first direction will rotate said second cam in integral relationship and yet said second cam will not be rotated by rotation of said first cam in said first direction; and

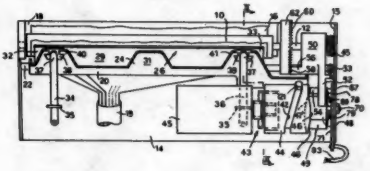
said second cam having a cam lobe which acts on said cam follower to move, when said first cam is rotated in said second direction from said reference position, said base member to position said correction ribbon to said print position.

4,573,814

DOT MATRIX PRINTER

Pierangelo Berruti, Chivasso, and Giancarlo Cella, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C. S.p.A., Ivrea, Italy

Filed Nov. 5, 1984, Ser. No. 668,158
Claims priority, application Italy, Nov. 18, 1983, 68208 A/83
Int. Cl.[4] B41J *19/92, 19/80*
U.S. Cl. 400—568 **4 Claims**



1. A dot matrix printer comprising

a housing,

a shaft rotatably mounted on said housing,

a cylindrical platen mounted on said shaft,

a printing head reciprocally movable along said platen for selectively printing dots on a printing medium located on said platen and a line-spacing device to intermittently advance said medium between two successive lines of printed dots,

said line-spacing device comprising a toothed gear wheel mounted on said shaft and coupled with said platen and an arm pivotally mounted on said shaft and arranged for radial and axial displacements on said shaft relative to said toothed gear wheel, said arm being actuated by a single cylically rotatable cam member for intermittently rotating said toothed gear wheel, said cam member having a radial cam profile and an axial cam profile, said arm comprising an axially extending toothed sector engageable with a corresponding frontal toothing of said toothed gear wheel, a first cam follower actuated by said axial cam profile for axially translating said arm with respect to said toothed gear wheel from a first position in which said sector meshes with said frontal toothing to a second position in which said sector is axially spaced from the toothed wheel, and a second cam follower actuated by said radial cam profile for rotating said arm in a direction to advance said medium when said arm is in said first position and for rotating said arm in an opposite direction when in said second position.

4,573,815

PRINTER

Yasunori Watanabe, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 21, 1984, Ser. No. 653,077
Claims priority, application Japan, Sep. 30, 1983, 58-152834[U]
Int. Cl.[4] B41J *13/14*
U.S. Cl. 400—642 **13 Claims**

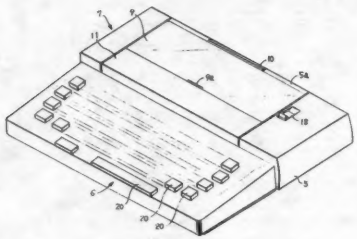
1. A printing device including a print mechanism wherein a print head is disposed in front of a platen and moves along said platen for printing characters on a sheet of paper which is backed up by said platen and fed perpendicular to a longitudinal direction of said platen, comprising:

covering means including a main cover having an opening which is located above said print mechanism and extends over a printing width of said print mechanism;

a paper holder pivotally mounted on said main cover at a position adjacent to a rear end of said opening, said paper holder being pivotable between a closed position for covering said opening and an open position wherein said paper holder uncovers said opening and extends obliquely in a first rear upward direction away from said print

mechanism, said paper holder being pivoted in a first direction from said closed position to said open position to support and guide the sheet of paper supplied to said print mechanism; and

a paper guide mounted on said covering means adjacent to a front edge of said opening of said main cover for pivotal motion about an axis, said paper guide being retained by biasing means in a paper-guiding position thereof when said paper holder is in said open position, said paper guide



in said paper-guiding position extending obliquely in a second rear upward direction from said axis of pivot over said print mechanism to define a paper exit path along which the printed sheet of paper is fed from said print mechanism out of said opening, said paper guide being pushed downwardly by said paper holder and pivoted in said first direction to a storage position thereof against a biasing force of said biasing means when said paper holder is pivoted to the closed position in a second direction opposite to said first direction.

4,573,816

ELASTIC BEARINGS FOR SHAFTS

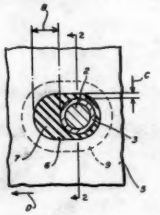
Gerhard Pamler, Nuremberg, Fed. Rep. of Germany, assignor to Triumph-Adler A.G. fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,269

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325279

Int. Cl.[4] F16C *27/06*; B41J *11/04*

U.S. Cl. 400—661 **5 Claims**



1. Apparatus for mounting the trunions of a printing machine platen to constrain oscillations resulting from type character impacts thereagainst essentially to a predetermined direction only comprising,

machine side frames having generaly non-circular openings having their longest dimension extending in said predetermined direction,

complimentary shaped elastic noise buffers mounted in said frame openings, and

trunion bushings mounted in openings through and adjacent one end of said buffers so that the dimension of the buffers relative to the trunion axis in said predetermined direction is a multiple of the dimensions in other directions such that oscillations are constrained essentially to said predetermined direction.

4,573,817

MECHANICAL PENCIL

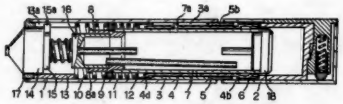
Mitsuo Maki, Tokyo; Tomohiro Hosoo, Chiba, and Katsuyoshi Kikukawa, Koshigaya, all of Japan, assignors to Platinum Pen of America, Inc., Tex.

Filed May 8, 1981, Ser. No. 261,987

Claims priority, application Japan, Jul. 22, 1980, 55-102750

Int. Cl.[4] B43K *21/00, 21/22*

U.S. Cl. 401—65 **6 Claims**



1. A mechanical pencil, comprising:

(a) a barrel having an open, flat frontal end;

(b) sheath means disposed axially adjacent to said barrel at the rear end thereof;

(c) cam means positively engaging said sheath means, said cam means having a camming surface mounted for rotation and for movement forwardly and backwardly in an axial direction within a predetermined range with respect to said barrel;

(d) slider means fitted in said cam means;

(e) support means fixedly fitted onto the front end of said slider means;

(f) writing unit means provided with a push type lead feed mechanism fixedly fitted into the front end portion of said support means;

(g) cam engagement means on said slider means for engaging said camming surface, said camming surface being configured and dimensioned to move said slider means from a first position wherein said writing unit means fixed thereto through said support means is entirely contained within said barrel to a second position wherein said writing unit means fixed thereto through said support means protrudes from said frontal end of said barrel;

(h) first spring means to urge said cam means toward said frontal end of said barrel when said writing unit means is in said first position, thereby urging said sheath means into close-fitting relationship with said barrel; and

(i) second spring means to urge said cam means backwardly within said barrel when said writing unit means is in said second position, thereby urging said sheath means into spaced axial relationship with said barrel.

4,573,818

CAP ASSEMBLY FOR A SINGLE OR PLURAL WRITING INSTRUMENTS

Kimio Kodera, Tokyo, Japan, assignor to Platinum Pen Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,573

Claims priority, application Japan, Feb. 29, 1984, 59-27438[U]

Int. Cl.[4] B43K *9/00*

U.S. Cl. 401—131 **5 Claims**

1. A modular writing instrument cap system, comprising:

at least one cap including a tubular sidewall having one open end and an opposite end closed by a transversely-oriented tubular barrel which includes a transversely-oriented bore that is open at both ends;

means on said cap sidewall constructed and arranged for removably securing the cap on a writing instrument in telescopically enclosing relation to a working end of such writing instrument;

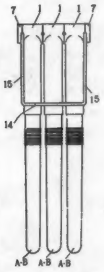
said barrel being coaxially abuttable end-to-end with corre-

sponding barrels of like caps to provide a series of adjoining caps, effectively having a shared transversely-oriented bore, and an exposed barrel end at each end of such series;

a generally U-shaped bail, including a cross-arm and two generally parallel legs, each leg having a free end portion which is bent back generally at approximately a right angle and includes intermediate its extent an at least generally semi-circular hump, so that each such free end portion is generally omega-shaped;

each end of each said barrel having means defining a correspondingly omega-shaped groove formed therein so as to open axially outwardly thereof;

a pair of terminator rings each having a corresponding omega-shaped groove formed therein so as to open axially



inwardly therefrom; each bail free end portion being received in a passageway defined by confrontation of a respective said omega-shaped groove at a respective exposed barrel end and a respective said omega-shaped groove in a respective said terminator ring;

at least one internally threaded sleeve received in said transversely-oriented bore so as to have one end disposed adjacent a said omega-shaped groove of one said exposed barrel end and another end disposed adjacent a said omega-shaped groove of an opposite said exposed barrel end; and

a respective screw bearing from axially outwardly against each terminator ring and having a shank thereof threaded into said at least one sleeve for securing said bail in relation to said at least one cap.

4,573,819

SYSTEM FOR SUPPLYING INK FOR WRITING INSTRUMENTS

Günther Herrnring, Alvesloe, Fed. Rep. of Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,257

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220750

Int. Cl.⁴ B43K *5/00, 5/08, 5/18, 5/10*

U.S. Cl. 401—151 **9 Claims**

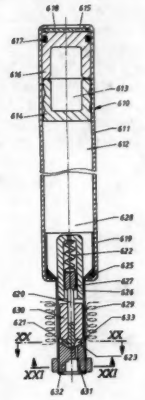
1. A system for supplying ink or writing liquid for a writing instrument which operates with liquid ink and has a writing element, said system in combination comprising:

a primary, permanently compressible, non-capillary, large-volume reservoir for said liquid ink that has an overpressure therewith;

a secondary, small-volume reservoir which communicates with the atmosphere and with said writing element;

an auxiliary charging valve for producing a connection between said primary and secondary reservoirs, said auxiliary charging valve being controllable as a function of need;

an electric motor which has a rotor; said auxiliary charging valve including a valve seat structurally arranged therewith, and a valve body provided with said rotor of said electric motor operable as a pump drive for conveying the liquid ink from the primary reservoir to the secondary reservoir and then to the writing element, said valve body cooperating with said valve seat, which is coaxially dis-



posed relative thereto; said valve body being provided with a recess which communicates with said primary reservoir, and said valve seat being provided with a channel which communicates with said secondary reservoir.

4,573,820

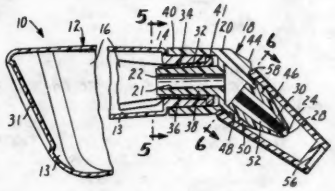
APPLICATOR TIP ASSEMBLY FOR A PEN-LIKE INSTRUMENT

Kenneth J. Kirchhoff, Gem Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 2, 1984, Ser. No. 627,288

Int. Cl.⁴ B43K *3/04, 7/10*

U.S. Cl. 401—214 **1 Claim**



1. An applicator tip assembly for use in a pen-like instrument, said tip assembly comprising:

a body having an inlet end and an outlet end, having a through opening with an inlet in said inlet end, and an outlet in said outlet end;

an applicator member within said through opening having a surface shaped to make sealing engagement against said body at said outlet end and being shaped to project through said outlet and past the outlet end of said body when said applicator member is in engagement with said body; and

spring means for biasing said applicator member against the outlet end of said body, wherein said through opening in said body is partially defined by longitudinally extending radially inwardly projecting spaced fins, and said spring means comprises an elongate coil spring having a compressible portion between and guided for longitudinal movement by said fins adjacent said applicator member, and an anchor portion at the end of said compressible

portion opposite said applicator member in firm engagement with the inner edges of said fins, portions of said through opening defined between said fins affording easy passage of fluid around said spring in said through opening.

4,573,821

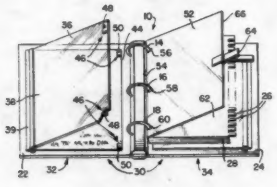
WINDOW INDEX SYSTEM FOR RING BINDERS

Charles T. Gilreath, 217 NW. 34 Drive, Gainesville, Fla. 32607

Continuation of Ser. No. 456,537, Jan. 7, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,972

Int. Cl.[4] B42D *13/00, 11/04, 21/00*

U.S. Cl. 402—78 **14 Claims**



11. A window system in combination with a loose-leaf ring binder of the type including a spine having a plurality of rings for retaining sheets, a front cover, and a rear cover, said window system comprising:

a transparent homing window sheet having elongated apertures at one edge in engagement with the sheet-retaining rings as the first sheet immediately inside one of the covers for protecting and facilitating view of an information record sheet also secured by the sheet-retaining rings and underlying said transparent homing window sheet, said homing window sheet having sufficient rigidity to serve as a sheet lifter; and

an extending tab at another edge of said homing sheet to facilitate return to said transparent homing window sheet from any location within the ring binder.

13. A loose-leaf ring binder comprising:

a spine including a plurality of rings for retaining sheets;

a front cover;

a rear cover; and

at least one prime storage area including:

a transparent window sheet hinged at one edge to the inside of at least one of said covers for protecting and facilitating view of a first underlying information record sheet,

a latch system including at least one element carried by said hinged transparent window sheet and at least one other element carried by one of said covers in alignment with said one element for retaining said hinged transparent window sheet and the underlying information record sheet against the inside of said one of said covers, and

a transparent homing window sheet secured at one edge by said sheet-retaining rings as the first sheet immediately inside said one of said covers for protecting and facilitating view of another information record sheet also secured by said sheet-retaining rings and underlying said transparent homing window, said homing window sheet having sufficient rigidity to serve as a sheet lifter.

4,573,822

SHEET LIFTER FOR A LOOSE LEAF BINDER

Dell K. Allen, 195 S. Inglewood Dr., Orem, Utah 84057

Filed Feb. 27, 1984, Ser. No. 583,769

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—80 L **14 Claims**

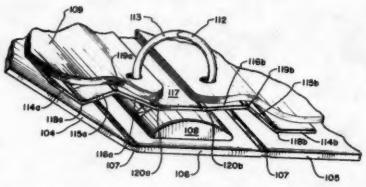
1. In a loose leaf binder comprising a pair of outer leaves joined to a spine and a plurality of rings mounted on a spring plate attached to said spine, an apparatus for lifting sheets secured by the rings of said loose leaf binder, said apparatus comprising a pair of flexible members each of said flexible members having an inner edge thereof permanently joined to said spine and an outer edge thereof permanently joined to one of said outer leaves and a middle portion defined between said edges, the middle portions of said flexible members being unattached to said spine and outer leaves such that when said outer leaves are folded to a closed position said middle portions of said flexible members will buckle so as to lift said sheets secured to said rings.

12. An apparatus for lifting sheets bound within a binder comprising:

a pair of first strip members;

a pair of second strip members positioned adjacent and parallel to each of said respective first strip members;

means for hingeably connecting said first strip members to said respective second strip members along adjacent parallel edges thereof;



a pair of third strip members positioned adjacent to said first strip members and opposite to said second strip members, each of said third strip members being permanently attached to a leaf of said binder;

means for hingeably connecting said third strip members to said respective first strip members along adjacent parallel edges thereof;

a fourth strip member positioned adjacent and parallel to said second strip members and opposite to said first strip members, said fourth strip member being attached to the spine portion of said binder; and

means for hingeably connecting said fourth strip member to said second strip members along adjacent parallel edges thereof.

4,573,823

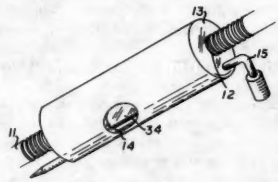
ADJUSTABLE PASS-THROUGH JOINT

Victor S. Dennis, 13342 Mango Dr., Del Mar, Calif. 92014

Filed Jan. 28, 1985, Ser. No. 695,470

Int. Cl.[4] F16B *7/18;* **F16C** *11/00*

U.S. Cl. 403—118 **8 Claims**



1. An adjustable pass-through join comprising:

a main joint body having

a first bore longitudinally therethrough, and

a second bore orthogonally intersecting said first bore;

a clamping member rockingly inserted into said second bore and having an opening in line with said first bore;

a rod slideably installed through said first bore and said opening;

wherein said opening is shaped and dimensioned to permit

free axial travel of said rod therethrough when said locking member is held in a first position, and to prevent the axial travel of said rod when said clamping member is held in a second position; and

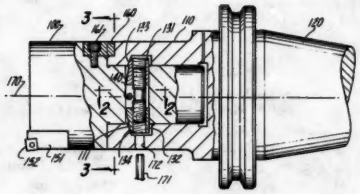
means for locking said clamping member in said second position including means for rotating said clamping member about the axle of said second bore until opposite sides at opposite ends of said opening are forced against said rod.

4,573,824

APPARATUS FOR COUPLING A FIRST MEMBER TO A SECOND MEMBER

Ray G. Ehle, Redford, Mich., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 10, 1984, Ser. No. 578,802
Int. Cl.[4] F16B *21/00*
U.S. Cl. 403—322 **14 Claims**



1. Apparatus for coupling a male member to a female member along a common longitudinal axis, the male and female members each having shank portions, with the male member having an axially extending pilot portion of cross-sectional area less than that of the male member shank portion and a first section adjoining the shank portion and a smaller second end section, the pilot portion shaped for mating engagement with a cavity in the shank portion of the female member, the apparatus comprising:

first and second wedge means each having a wedging surface, the first and second wedge means carried by the male member on the second section of the pilot;

wedge actuator means coupled to the first and second wedge means, operative to simultaneously move the first and second wedge means in opposite directions traverse to the longitudinal axis; and

conical reaction surface means on the female member confronting complementary convex conical wedging surfaces of the first and second wedge means in a manner such that as the wedge actuator means moves the first and second wedge means in predetermined opposite directions, the wedging surfaces engage the reaction surface means with substantial surface contact so as to provide a force urging the first and second members together along the axis in substantially rigid fashion.

4,573,825

APPARATUS FOR MOUNTING A DISK TO A SHAFT

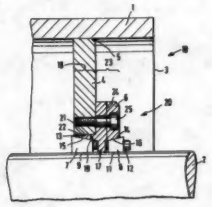
Ralph Muellenberg, Im Wiesengrund 6, D-4048 Grevenbroich 12, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,825
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315769
Int. Cl.[4] B25G *3/20*; F16B *2/00*
U.S. Cl. 403—370 **8 Claims**

1. An apparatus for mounting a disk on a shaft, said disk having a central opening through which said shaft extends, said apparatus comprising:

a flanged hub ring, said hub ring having an axially extending radially thin walled portion having an outer circumferential surface abutting an inner surface of said disk along said central opening, a radially thick walled portion connected to said thin walled portion and disposed outside of said central opening, and a pair of oppositely inclined conical surfaces formed on said hub ring;

two individual rings split into a plurality of segments, said rings received at axially spaced positions on said shaft, said rings having oppositely inclined conical surfaces mating, respectively, with said conical surfaces of said hub ring; and



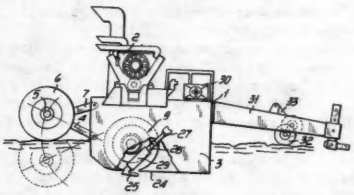
means to move said individual rings relative to each other such that the conical surfaces of said individual rings produce a radially outward pressure on the conical surfaces of said hub ring, said means comprising screws connected to draw said rings toward one another.

4,573,826

MOBILE CRUSHER UNIT FOR CLEARING ROUGH TERRAIN, PREPARING ROAD FORMWORKS AND ROADBEDS, OPERATING OPEN-WORKS MINES, AND THE LIKE

Alessandro Piovesan, Rovigo, Italy, assignor to ATIC S.r.l., Taglio Di Po, Italy

Filed Mar. 29, 1984, Ser. No. 594,832
Claims priority, application Italy, May 23, 1983, 21228 A/83
Int. Cl.[4] E01L *23/00*
U.S. Cl. 404—90 **2 Claims**



1. A mobile crusher unit, comprising a power driven horizontal rotor including a shaft rotatively carrying spaced-apart discs provided, adjacent the edges thereof, with at least three throughgoing round holes located at symmetrical locations with respect to said shaft, through said aligned holes in said discs there being passed as many cylindrical bars carrying, in rotary fit, hammer yoke holders each whereof is positioned between a said disc pair and has, at least at corresponding locations on the legs thereof, two throughgoing holes, one of which is threaded and the other has an enlarged cross-section portion, secured between each leg pair of said hammer yoke holders, in rotary fit by means of a threaded pin, there being a hammer comprising substantially an elongate prismatic element having a corresponding throughgoing hole, a serrated blade being further provided, located at a lower level than said shaft and having a horizontal longitudinal axis, said serrated blade being subjected to oscillatory movements in a normal direction to the plane of lay thereof, said rotor and blade being carried on a self-propelled frame the rearward end whereof is mounted on two wheels interconnected by an axle adapted to be raised from and lowered onto said frame, a pair of double-

acting hydraulic jacks being provided for producing the oscillatory movements of said blade, said jacks having parallel axes and forming a given angle from vertical, the connection between the piston rods of said jacks and the corresponding ends of said oscillating blade being accomplished by means of a rod encompassed by a protective sleeve.

4,573,827

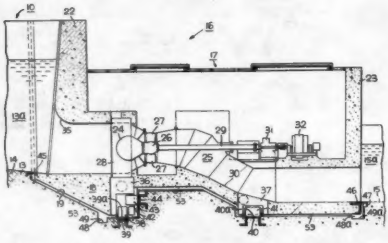
LATERALLY MOVABLE POWERHOUSE

Howard A. Mayo, Jr., York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 10, 1984, Ser. No. 609,027

Int. Cl.[4] E02B 9/08

U.S. Cl. 405—78 **12 Claims**



1. A hydraulic turbine installation for a site comprising a dam having a floor and opposing sidewalls defining a spillway for water flow from an upper elevation to a lower elevation,

a frame member;

a hydraulic turbine carried by said frame member comprising a water passageway defined by said frame; a turbine runner within said passageway and a generator operably connected to said runner to be driven by said runner;

said frame member having intake means for directing water to the runner;

said floor having an upper surface including a plurality of bearing surface portions with said bearing surface portions on a downstream side of said dam and extending horizontally transverse to said direction of water flow; said bearings surface portions having a length horizontally transverse to said direction of water flow with said length sufficient to span said spillway and extend past a downstream side of said dam a distance greater than a width of said frame member;

bearing means secured to a bottom surface of said frame member and aligned to support said frame member on said bearing surface portion for providing sliding movement of said frame horizontally transverse to said direction of water between a first position with said frame member intake means within said spillway and a second position with said frame member out of said spillway and on a downstream side of said dam;

power actuated means for selectively sliding said frame member between said first and second positions.

4,573,828

ROOF SUPPORT SUITABLE FOR USE IN MINES

Michael D. Jones, Worcester, and James B. Longford, Gloucester, both of England, assignors to Dowty Mining Equipment Limited, England

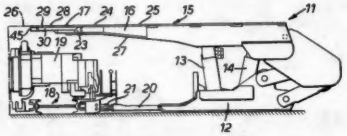
Filed Apr. 3, 1984, Ser. No. 596,254

Claims priority, application United Kingdom, Apr. 29, 1983, 8311825

Int. Cl.[4] E21D 15/44, 17/08

U.S. Cl. 405—293 **11 Claims**

1. A roof support, suitable for use in mines, including a floor-engaging structure, extendable and contractible prop means carried by said structure, a roof-engageable canopy, supported by said prop means, which comprises a main portion and an extension portion each of which includes a respective upper plate member and a respective lower plate member, the upper faces of the two upper plate members being engageable with the roof, and fastening means for rigidly connecting said



extension portion and said main portion together, the one immediately adjacent the other to provide smooth, substantially uninterrupted, transition from one said upper face to the other, said fastening means including at least one connecting member adapted to lie at least substantially within the thickness of said upper plate members.

4,573,829

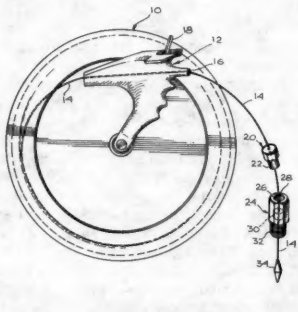
PLASTIC-PIPE LOCATOR TOOL

Terrell M. Keene, 800 S. Bradfield Ave., Compton, Calif. 90221; Wiley C. Calhoun, 13739 McNab St., Bellflower, Calif. 90706; Edgar J. Flemming, 5742 S. Van Ness St., Los Angeles, Calif. 90062; Eugene E. Haggard, 4259 N. Jerry Ave., Baldwin Park, Calif. 91706; David L. Taylor, 11249 Hulme Ave., Lynwood, Calif. 90262; Richard N. Hartley, 11600 Hollyview Dr., La Mirada, Calif. 90638; Francisco J. Martinez, 8348 Terradell St., Pico Rivera, Calif. 90660; Harry E. Sullivan, 1559 Albright St., Upland, Calif. 91786; Arvil B. Mason, 13627 Ocana Ave., Bellflower, Calif. 90706, and Wayne M. Lucas, 411 N. Willow Ave., Long Beach, Calif. 90806

Filed Jun. 29, 1984, Ser. No. 626,191

Int. Cl.[4] E03B 7/09

U.S. Cl. 405—157 **5 Claims**



1. A plastic-pipe locator tool including:

a hand-grip portion;

a reel rotatably supported from said hand-grip portion;

a locator wire extendably carried by said reel, said hand-grip portion having an opening therethrough for the passage of said locator wire;

a plastic bushing having an opening therethrough of a first diameter and having an externally threaded portion thereon of a second diameter;

a coupler having first and second ends and having an opening therethrough to permit the passage therethrough of said locator wire;

said opening through said coupler being internally threaded proximate said first end of said coupler and being dimensioned to receive, in cooperating fashion, said externally threaded portion of said first bushing;

a packing member for preventing the leaking of fluid from

said coupler, said packing member being carried snugly in said opening through said coupler and having a centrally disposed passage therethrough dimensioned to snugly but slidably engage said locator wire as it passes through said coupler; and,

a guide member affixed to said locator wire at the end of such wire remote from said reel, said guide member being of an oblate-spheroid-like shape.

4,573,830

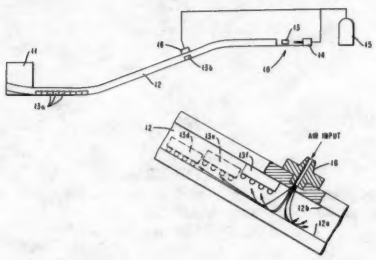
CHIP DECELERATOR

Raymond H. Richardson, Essex, and Robert T. Valley, South Burlington, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1984, Ser. No. 622,913

Int. Cl.[4] B65G *51/03*

U.S. Cl. 406—84 **3 Claims**



1. A workpiece transfer apparatus comprising:

a reservoir of workpieces to be transferred, each of said workpiece having a predetermined length,

a receiving element for receiving a workpiece transferred from said reservoir,

a track having a bottom, sidewalls and a top, at least partially closed, and an inclined section coupling the reservoir and the receiving element,

means for applying a timed propelling pulse of gas to a selected workpiece to propel the selected workpiece from the reservoir onto the track towards said receiving element,

means mounted on said inclined section of said track more than five workpiece lengths from the propelling means, for applying, at a selected time after the selected workpiece has entered the track, a timed decelerating pulse of gas, perpendicular to the direction of travel of said propelled selected workpiece to decelerate said selected workpiece at a predetermined position in said track so that upon termination of the timed decelerating pulse of gas, the selected workpiece is relieved of said decelerating pulse of gas and permitted to traverse the remainder of the track under the influence of the force of gravity.

4,573,831

CUTTER BLADE

Ralph W. Lacey, Grosse Point Parke, Mich., assignor to Dijet Industrial Co., Ltd., Grosse Pointe, Mich.

Continuation of Ser. No. 544,134, Oct. 21, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,646

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—42 **12 Claims**

5. A milling cutter assembly, comprising:

a cutter body having a plurality of insert blade stations spaced apart about its periphery, and oriented to rotate about an axis disposed generally perpendicular to the direction of cutter feed;

a plurality of cutter blades mounted in said blade stations;

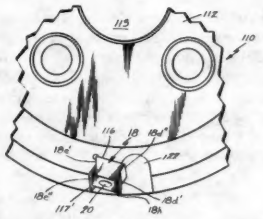
at least one of said cutter blades, having a blade body with a pair of opposite side faces, a plurality of peripheral edge surfces, and a cutting edge formed at the juncture of at least one of said peripheral edge surfaces with one of said side faces; said one cutter blade including a plurality of laterally spaced apart notches extending completely through said cutting edge to reduce chip width for improved chip removal, whereby during cutting a plurality of corresponding upstanding ribs are formed in the operating surface of the workpiece, which ribs are immediately removed from the operating surface of the workpiece by a subsequent one of said cutter blades before a subsequent pass of said one cutter blade through the workpiece; wherein

said cutter blade cutting edge is oriented at an acute, predetermined axial rake angle to the rotational axis of said cutter body; and

said notches through said cutting edge are defined by opposite sidewalls that are oriented in a mutually divergent relationship in a direction away from said cutting edge, wherein each of said notch sidewalls is disposed at a small acute recession angle to a plane normal to said cutting edge, whereby said notch sidewalls do not abut the ribs formed by said notches as said cutter blade cuts through the operating surface of the workpiece.

10. A milling cutter assembly, comprising:

a cutter body having at least one blade station positioned at its periphery; said blade station including a blade receiving slot defined by a flat base surface and a convex, generally



V-shaped back surface with inner and outer reference surfaces; said inner reference surface being flat, positioned radially inwardly of said outer reference surface, and intersecting said base surface at a predetermined acute angle; said blade receiving slot including a relief channel extending along the intersection of said inner reference surface and said base surface;

at least one cutter blade having opposite side faces and a plurality of peripheral edge surfaces, wherein one of said side faces intersects a first one of said peripheral edge surfaces to form a cutting edge, and the other one of said side faces intersects a second one of said peripheral edge surfaces at an acute angle which is substantially commensurate with said predetermined acute angle of said blade receiving slot to form a mounting edge located opposite to said cutting edge; said second peripheral edge surface also intersecting a third peripheral edge surface at an angle greater than said V-shaped back surface;

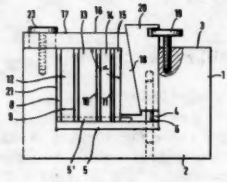
means for retaining said cutter blade in a predetermined orientation in said blade receiving slot, wherein said other side face and said second peripheral edge surface of said cutter blade abut said base surface and said inner reference surface respectively of said blade receiving slot, with the mounting edge of said cutter blade disposed within said relief channel, and said third peripheral edge surface of said cutter blade spaced apart from the second surface of said blade receiving slot, whereby cutting forces wedge said cutter blade securely into said blade receiving slot.

4,573,832

SINGLE AND MULTIPLE RECESSING TOOL

Karl Zinner, Nuremberg, Fed. Rep. of Germany, assignor to Firma Zinner GmbH, Nuremberg, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,627
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3219019
Int. Cl.[4] B23B *27/06, 29/22, 29/24;* B26D *3/06*
U.S. Cl. 407—70 9 Claims



1. A tool mounting comprising a holder element having a recess, an elongated cutting plate mounted in said recess, said holder element having a first and second side wall between which said cutting plate is mounted, a substantially L-shaped frame element mounted on said holder element, said L-shaped frame element having a first leg disposed over said cutting plate and a second leg spaced from said second side wall, said second leg having a sloping surface, a wedge element disposed between said second leg and said second side wall, said wedge element having an inclined surface, said inclined surface of said wedge element engaging said sloping surface to provide a wedging action to thereby laterally clamp and wedge said cutting plate against said first side wall, a first clamping screw engaging said frame element and threaded into said holder element to secure said frame element on said holder element, a second clamping screw threaded into said holder element and operably engaging said wedge element to dispose said wedge element toward the bottom of said recess, said elongated cutting plate having a generally longitudinal axis extending along the longitudinal length thereof and having a cutting edge on at least one longitudinal end thereof, said cutting plate having a transverse groove extending generally transversely of said longitudinal axis, and a rib element on said holder element extending generally transversely of said longitudinal axis, said rib element being engaged by said groove, said cutting plate being slideable transversely of said longitudinal axis as said rib element slides in said groove, whereby said engaged groove and rib element establish the longitudinal position of said cutting plate on said holder element.

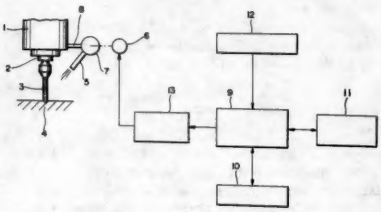
4,573,833

NOZZLE DEVICE FOR CUTTING FLUID FOR MACHINE TOOLS

Koji Kondo, Fukui, Japan, assignor to Kabushiki Kaisha Matsuura Kikai Seisakusho, Japan

Filed Oct. 14, 1983, Ser. No. 542,213
Claims priority, application Japan, Dec. 13, 1982, 57-217039
Int. Cl.[4] B23B *39/08, 51/06;* B05B *15/08*
U.S. Cl. 408—3 2 Claims

1. A machine, comprising a tool support, a cutting tool rotatably mounted and vertically movable on said support, means supporting a workpiece for engagement by said tool, a rotary actuator rotatably supported on said support, a nozzle having a fluid discharge carried by said actuator and rotatable with said actuator to aim the discharge at the engagement of said tool with the workpiece, a drive motor connected to said actuator to rotate said actuator for varying the direction of the discharge relative to said tool, and control means connected to said drive motor to regulate the driving of said drive motor in



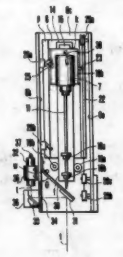
accordance with a program positioning of the tool relative to the workpiece.

4,573,834

PIERCER

Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan

Filed Dec. 31, 1984, Ser. No. 687,590
Int. Cl.[4] B23G *1/00*
U.S. Cl. 408—16 3 Claims



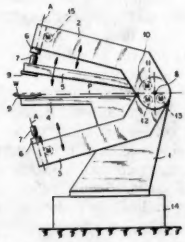
1. A piercer comprising a frame including an upper frame section and a lower frame section of given lengths and which are disposed in parallel opposing relationship with a given difference in elevation therebetween, a channel plate extending uprightly from the free end of the upper frame section to a given height and including an associated guide plate or guide rail extending lengthwise thereof, a slider disposed to be movable up and down along the guide plate or the guide rail and fixedly carrying a rotary drill with its drill bit directed downward, a reflector disposed slightly below the tip of the drill bit, a lamp disposed in a wall of the channel plate for directing light toward the reflector so as to be reflected thereby to project a point mark of light to a location which is vertically and directly below the tip of the drill bit, the reflector being disposed to be movable away from the path of movement of the drill bit during the upward and downward movement of the slider, and an anti-deflection holder for the drill bit which is located slightly above the location of the tip of the drill bit, the anti-deflection holder being adapted to move down together with the rotary drill, to remain stationary on a stack of cloths as the drill bit pierces through the stack of cloths and then moves upward together with the rotary drill during the upward movement thereof.

4,573,835

MACHINE FOR BORING A PLATE WORKPIECE

Rudolf Eckardt, Wesel, and Horst Frielingsdorf, Remscheid, both of Fed. Rep. of Germany, assignor to Flachglass Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,968
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034107
Int. Cl.[4] B23B *47/00*
U.S. Cl. 408—37 4 Claims



1. A machine for boring a hole in a glass plate, said machine comprising:

a support;

a lower clamp arm carried on said support and having an upper clamp surface adapted to support the glass plate;

an upper clamp arm carried on said support and having a vertically displaceable lower clamp surface adapted to press the glass plate down against said upper clamp surface;

a lower drill arm pivotal about a horizontal axis on said support and having an outer end provided with an upwardly directed boring tool centered on a tool axis;

an upper drill arm pivotal about said horizontal axis on said support and having an outer end provided with a downwardly directed boring tool centered on a tool axis, the tool axes lying in a common vertical plane generally perpendicular to the horizontal axis;

drive means for rotating the tools about the respective tool axes; and

motor means for moving at least one of said clamp arms toward the other clamp arm to secure the glass plate between the clamp surfaces and for pivoting both of said drill arms similarly toward each other about the horizontal axis from a position with the tool axes crossing each other toward a position with the tool axes coaxial and the tools in vertical engagement through the glass plate held by the clamp arms, whereby such movement of said tool arms bores a hole vertically through the glass plate.

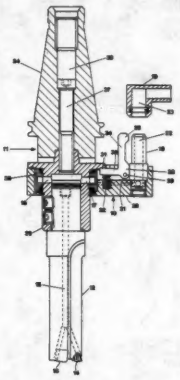
4,573,836

DEVICE FOR TRANSFERRING FLUID TO A ROTATING TOOL HOLDER

Kjell Andersson, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Mar. 30, 1983, Ser. No. 480,479
Claims priority, application Sweden, May 21, 1982, 8203183
Int. Cl.[4] B23Q *11/10*
U.S. Cl. 408—59 9 Claims

1. A device for transferring fluid, such as cooling or flushing medium, to a rotary holder for a tool for chip-forming machining of workpieces, such as a drill, the device comprising a housing arranged on the holder for rotation relative thereto about an axis of rotation, said housing comprising a first connecting member intended to, in use, be connected to a second connecting member on a machine tool, said second connecting member communicating with a fluid source, first passage means in said housing for connecting the fluid source with second passage means in the holder, said housing being provided with a locking means which is adapted to non-rotatably interconnect the housing and the holder when the first and second connecting members are moved apart and release the holder from the housing for rotation relative thereto about said axis when said first and second connecting members are connected to each other, the improvement wherein the locking means is adapted to release the holder from the housing upon the application of a force on the locking means directed substantially radially with reference to said axis.

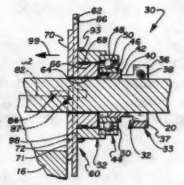


4,573,837

LONGITUDINAL FEED ATTACHMENT FOR A BORING BAR

James F. Flaten, Burnsville, Minn., assignor to Tobin-Arp Manufacturing Company, Eden Prairie, Minn.

Filed Feb. 3, 1984, Ser. No. 576,910
Int. Cl.[4] B23B *39/00*
U.S. Cl. 408—111 12 Claims



1. A feed attachment for controlling the axial movement of a rotatable boring bar relative to a workpiece, the feed attachment comprising:

a base portion selectively secured to the bar for rotation therewith about the longitudinal axis of the bar;

a collar rotatably mounted concentrically with respect to the base portion so that the collar rotates about the axis independently from the rotation of the bar and base portion, the collar having a threaded portion thereon;

a workpiece engagement member having a reference surface on one side thereof for nonfixedly engaging a side surface of the workpiece and bearing a threaded portion on an opposite sude thereof which mates with the threaded portion of the collar; and

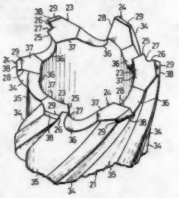
pin means extending outwardly from said one side of the engagement member for nonfixedly engaging an upper surface of the workpiece to limit rotation of the plate member with respect to the bar and workpiece and so that rotation of the collar moves the collar, base portion and bar axially with respect to said engaging means and the workpiece.

4,573,838

HOLE CUTTER

Takashi Omi, and Shohei Ohmi, both of Anjo, Japan, assignors to Omi Kogyo Co., Ltd., Anjo, Japan

Filed Apr. 5, 1984, Ser. No. 597,145
Int. Cl.[4] B23B *51/04*
U.S. Cl. 408—204 8 Claims



1. A hole cutter, comprising:

a generally cylindrical cutter body adapted to be rotated by power means and having an end portion, and

a plurality of first and second cutting teeth connected to and situated circularly around the end portion of the cutter body, said first and second cutting teeth being mutually interspersed around the end portion of the cutter body,

each first cutting tooth including at least one first cutting surface having a predetermined clearance angle and a cutting angle relative to the horizontal plane perpendicular to the central axis of the cutter body, said clearance angle extending rearwardly relative to the rotational direction of the cutter body and the cutting angle extending radially of the cutter body, and first and second cutting edges situated at a front end of the first cutting surface, said second cutting edge being situated radially outwardly and circumferentially rearwardly away from the first cutting edge relative to the cutter body so that the first and second cutting edges form stepped edges and the second cutting edge is located from the cutter body more remotely than the first cutting edge,

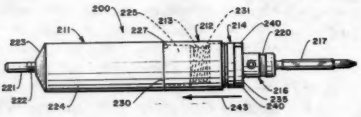
each second cutting tooth including at least one second cutting surface having the same clearance angle and cutting angle as those of the first cutting tooth, and a third cutting edge situated at a front edge of the second cutting surface of the second cutting tooth, said third cutting edge being located in the axial direction of the cutter body between the first and second cutting edges so that when the hole cutter is operated, the first, second and third cutting edges cut chips of different thickness to facilitate ejection of the chips from the hole cutter.

4,573,839

MOUNTING CHUCK FOR A DRILL HAVING REVERSIBLE TOOLS THEREIN

Danny Finnegan, 6840 Hickory Ave., Orangevale, Calif. 95662

Filed Aug. 16, 1982, Ser. No. 408,623
Int. Cl.[4] B23B *31/06*
U.S. Cl. 408—239 R 9 Claims



1. A mounting chuck adapted to contain one or more working tools in a position for use comprising:

a main body portion having an elongated axial passageway extending therethrough opening at one end and closed at the other end,and an elongated shank extending from said closed end coaxially aligned with said passageway for coupling said chuck to a drill;

a cylindrical member mounted in the open end of said main body portion having an axial passageway coaxial with the elongated axial passageway in the main body portion, said member terminating in an open end and having a cut-out wall section, said cutout wall section having parallel spaced internal walls and an aperture extending through said wall section and a detent in said aperture extending partly into said axial passageway therethrough but restrained from entering said passageway entirely, by the wall surrounding said aperture being less in diameter than the diameter of said detent;

a first collar rotatably mounted on the outer periphery of said member encircling said aperture and retaining said detent between the wall surrounding said aperture and the inner wall of said collar, said collar having inner wall portions of two differing diameters, one of said inner wall portions engaging said detent in a position whereby said detent extends into said axial passageway and the other of said inner wall portions being spaced a sufficient distance from the outer wall of said member to permit said detent to withdraw slightly out of said axial passageway in said member;

resilient means between said member and said body portion and said first collar normally biasing said first collar toward said open end of said body portion;

a tool holder having a main body portion having a configuration substantially the same as said cut-out wall section and insertible therein, said main body portion of said tool holder having an axially extending passageway axially aligned with the axial passageways through said member and said first mentioned main body portion, and a pair of bosses on both sides of said body portion of said tool holder, each of said bosses having apertures therein aligned with the passageway through said tool holder main body portion, and each of said bosses having tool retaining means therein adapted to extend into the apertures in said bosses to engage a tool inserted therein to thereby retain a tool in fixed position in said boss, each of said bosses having an annular groove therein adapted to receive said detent to lock said tool holder in said member only when said detent is in said groove, said tool holder being disposed in said main body portion with said detent entering said groove in one of said bosses; and

a second collar encircling a portion of the open end of said body member, said resilient means and the outer wall of said first collar, said second collar being freely rotatable and axially fixed relative to said first collar and adapted to serve as a handle whereby axial movement of said first collar against the bias of said resilient means toward the closed end of said main body portion allows said detent to withdraw slightly out of said passageway through said member and into said groove in said boss while release of said first collar permits said resilient means to bias said first collar back to its normal position where said detent extends slightly into said passageway through said member and into said groove in said boss.

4,573,840

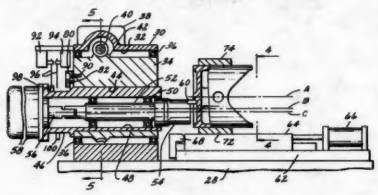
PISTON COUNTERBORING MACHINE

Frank C. Skrentner, Fenton, Mich., assignor to Lamb Technicon Corp., Warren, Mich.

Filed Apr. 2, 1984, Ser. No. 596,141
Int. Cl.[4] B23C *3/04, 3/34*
U.S. Cl. 409—200 11 Claims

1. A machine for machining the solid outer end face of a piston so as to form in said end face an annular counterbore with an axially outwardly projecting central land at the center thereof comprising, a base, a headstock housing on said base having an axial bore therein, means for mounting a piston to be machined on said base so that the central axis of the piston is aligned with the axis of said bore, a carrier journalled for

rotation in said bore, said carrier having an axially extending bore therein which is eccentric relative to the axis of rotation of the carrier, a spindle housing secured in the bore of the carrier to rotate therewith, said spindle housing being rotatably adjustable in said carrier bore, said spindle housing having an axially extending bore therein which is disposed eccentrically relative to the central axis of the spindle housing, a tool spindle journalled for rotation in said spindle housing bore and constructed and arranged to receive a cutting tool thereon adapted to engage said end face of the piston when the piston and tool



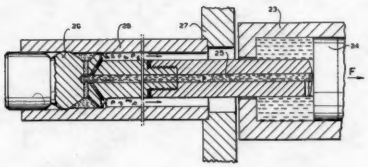
are displaced axially toward one another, means for moving the piston axially relative to the spindle, a motor carried by said spindle housing for rotation therewith and having an output shaft operably connected to said spindle for rotating the spindle around its own central axis to rotate the cutting tool, and drive means simultaneously rotating the carrier about the axis of the bore of the headstock housing through at least one revolution so as to cause the rotating cutting tool to orbit around the central axis of the housing bore and thereby machine said counterbore.

4,573,841

METHOD OF AND APPARATUS FOR THE FINISH SHAPING OF PROFILED CYLINDRICAL HOLES

Georgi K. Petkov; Nikola M. Netzov; Botyo P. Botev, and Dimiter N. Bankovski, all of Gabrovo, Bulgaria, assignors to N P S P po Hydroplastichaa Obrabotka na Metalite, Gabrovo, Bulgaria

Filed Nov. 15, 1983, Ser. No. 551,716
Claims priority, application Bulgaria, Dec. 22, 1982, 58988
Int. Cl.[4] B23D *37/00, 43/02*
U.S. Cl. 409—244 **8 Claims**



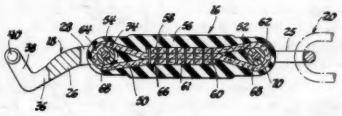
1. A method for the precise and finish processing of a profiled cylindrical hole in a workpiece, comprising first removing chips along the hole being processed and during the removal of the chips along the hole subjecting the machined zone of the hole to plastic deformation by feeding fluid under high pressure and at a high speed into the deformation zone, whereby the fluid also removes the chips from the machined deformation zone.

4,573,842

RESILIENT TIE-DOWN DEVICE

Ralph F. Mantela, Union Lake; Charles J. Brady, Milford; Thomas M. Johnson, Howell; Hugh W. Larsen, Milford, and Thomas L. Schallhorn, Howell, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1983, Ser. No. 469,254
Int. Cl.[4] B60P *3/06*
U.S. Cl. 410—23 **1 Claim**



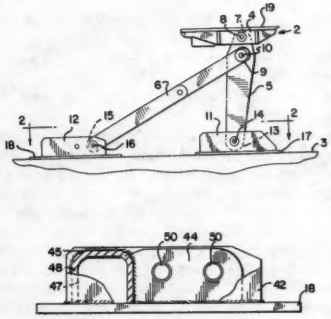
1. A resilient tie-down device adapted to be interposed between a hook device connected to a vehicle frame and a chain connected to a vehicle transporter for providing a restraint system which reduces forces transmitted to the vehicle during shipment thereof, said resilient tie-down device including an elongated webbing having a pair of opposed ends and made of a woven yarn of synthetic material having a minimum breaking elongation of 30%, said webbing having each of said opposed ends doubled over so as to form a strap having a pair of spaced loop portions with said opposed ends located between said loop portions, a first guide member located in one of said loop portions of said strap for pivotal connection with said hook device and a second guide member located in one of said loop portions of said strap for pivotal connection with said hook device and a second guide member located in the other of said loop portions of said strap for pivotal connection with said chain, means fastening said opposed ends of said webbing to each other between said loop portions, said strap being pretensioned and encapsulated in a jacket of elastomeric materials so as to provide a linear spring rate and minimize wear and abrasion of said strap.

4,573,843

HITCH MOUNTING MEANS

Harold E. Hesch, St. John, Ind., and George S. McNally, So. Holland, Ill., assignors to Pullman Standard, Chicago, Ill.

Filed Jun. 23, 1983, Ser. No. 507,143
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—58 **11 Claims**



1. A pivot mount for pivotally attaching an end of a fifth wheel support strut to a railway car, said mount comprising:
rigid base means;

a pair of end members spaced from each other and rigidly affixed to said base means;

a pair of lug members rigidly affixed to said base means, said pair of lug members being positioned between said end members and said lug members being spaced from each other and from said end members;

pivot means for pivotally attaching a support strut means to each of said end members and to a respective adjacent lug member spaced from each said end member; and

a support beam having:

a first wall portion attached to the base means and extending upwardly therefrom and being disposed transversely with respect to the lug and end members, the first wall portion having an upper end;

a second wall portion connected to the upper end of the first wall portion and extending transversely and rearwardly therefrom, the second wall portion having a rearward end; and

a third wall portion connected to the rearward end of the second wall portion and extending transversely and downward therefrom, the third wall portion having a lower end attached to the base means, whereby the support beam forms a torque box structure with the base means,

said torque box structure being rigidly affixed to each of said end members and each of said lug members for rigidifying said pivot mount and for receiving from the lug members and the end members forces received from the strut and for transmitting those forces to the base means, each of said lug members being rigidly affixed to one of said wall portions of said support beam and being supportingly engaged by another of said wall portions of said beam.

4,573,844

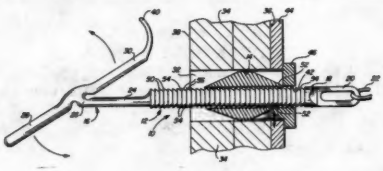
ANCHORING BOLT DEVICE

Gareth J. Smith, 15533 Tupper St., Sepulveda, Calif. 91343

Filed Nov. 25, 1983, Ser. No. 555,072

Int. Cl.[4] F16B *21/00*

U.S. Cl. 411—340 **13 Claims**



1. An improved anchor bolt device, said device comprising, in combination:

(a) a bolt adapted to be inserted through an opening in a wall, said bolt including

i. an elongated shaft bearing shaft surface gripping means, and,

ii. a pair of inter-connected, substantially rigid, opposed arms integral with and pivotally connected to the front end of said bolt and adapted to move between a collapsed, inoperative position wherein one arm extends forwardly of the end of shaft and the other arm extends rearwardly of said end of said shaft so as to pass with said shaft through an opening in a wall, and an operative extended position substantially at a right angle to said shaft, said pair of opposed arms when at rest, extending at an angle other than 90° with respect to said shaft,

iii. a portion of the front end of said shaft constituting resilient, deformable means connecting said shaft to said arms and adapted to urge said arm towards said operative position; and,

(b) a collet adapted to releasably connect to the rear portion of said shaft, said collet having,

i. an opening extending therethrough, which opening receives the rear end of said shaft, and,

ii. securing means surrounding said opening and adapted to releasably engage said shaft gripping means to releasably secure said shaft against a wall.

4,573,845

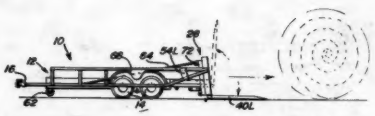
SELF-LOADING TRAILER

Marvin L. Carpenter, Rte. 2, Box 300, Diana, Tex. 75640

Filed Oct. 15, 1984, Ser. No. 661,231

Int. Cl.[4] A01D *90/08*; B60P *1/14*

U.S. Cl. 414—24.5 **14 Claims**



12. A self-loading and unloading trailer for use when towed by a farm tractor or the like in loading and unloading articles such as hay bales, the trailer comprising a wheeled frame having hitch means at a forward end thereof for connection to the tractor or the like, and a loading and unloading carriage at a rear loading end thereof, the carriage being pivotally mounted about a transverse axis at the rear of the frame and comprising elongate arms for receipt in the rearward ends thereof of respective releasable loading forks, the cariage having a lowered loading position wherein the forks extend behind the frame substantially level with the ground for backing under an article to be loaded, the carriage being pivotally movable from the loading position to an elevated position causing the forks to lift the article onto the rear end of the frame, aligned lengthwise track sections in the frame and carriage respectively, a carrier with a releasable fork mounted for movement along the track sections for moving the article lengthwise toward the forward end of the frame and for unloading articles from the frame by reverse movement of the carrier along the track sections, and drive means for selectively moving the carrier lengthwise in forward and reverse directions along the track sections and for pivoting the loading and unloading carriage between the loading and elevated positions.

4,573,846

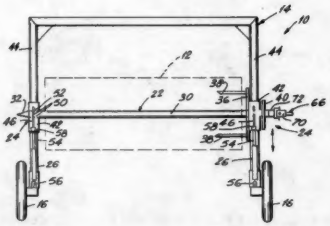
HAY BALE PROCESSOR

Weldon C. Willbanks, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Sep. 17, 1984, Ser. No. 651,525

Int. Cl.[4] A01D *87/12*

U.S. Cl. 414—24.6 **5 Claims**



1. An apparatus connected to a prime mover for handling a bale which comprises:

(a) a wheeled frame member;

(b) means for connecting said frame member to said prime mover to permit said frame member to be moved with

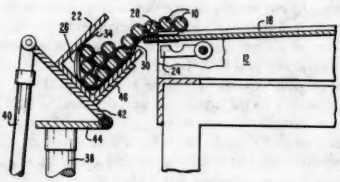
respect to said bale supported on the ground so that said frame member extends around said bale;
(c) an elongated support for engaging and supporting said bale;
(d) means on said frame member for rotatably engaging opposite ends of said elongated support member;
(e) means on said frame member for raising and lowering said elongated support member relative to said ground whereby upward movement of said elongated support member will cause said bale to be raised from said ground;
(f) means on said frame member for rotating said elongated support member whereby rotation of said elongated support member will cause said bale to unroll, wherein said elongated support comprises:
(a) an elongated shaft having a pointed end and a splined end, said pointed end passes through center of said bale while said splined end engages said means for rotating said elongated support member;
(b) a first disc member having bale penetrating tines affixed near splined end of said elongated shaft; and
(c) a second disc member affixed between said first disc member and said splined end of said elongated shaft; wherein said means on said frame member for rotatably engaging opposite ends of said elongated support member comprises:
(a) a pair of sleeves, each said sleeve slideably mounted to an upright portion of said frame member;
(b) a pair of plates, each said plate transversely mounted to each said sleeve and having a beveled edge extending outwardly therefrom;
(c) two pairs of rollers each said pair of rollers mounted to top of each said plate; and
(d) two pivotable spring loaded latches, each said latch mounted to each said sleeve above each said pair of rollers to rotatably engage one end of said elongated shaft whereby one of said latches is between said first disc member and said second disc member preventing elongated shaft from laterally sliding off said rollers.

4,573,847

NUCLEAR FUEL ROD CHANNEL TRAY LOADING SYSTEM

Cecil A. Howell, and Ernest R. Lacy, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1983, Ser. No. 522,898
Int. Cl.[4] B65G *57/18*
U.S. Cl. 414—63 **11 Claims**



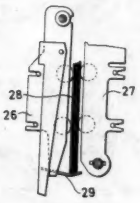
1. A system for loading a group of elongated rods into a tray from an inclined ramp having a lower terminus, comprising:
(a) a controllable rod stop disposed on said ramp, said stop having an engaged position which blocks said rods and a disengaged position which releases said rods;
(b) a hermetically-sealed envelope containing air of atmospheric pressure and having two generally opposing ends with one of said ends attached to said ramp proximate said ramp's lower terminus, said envelope also having a lower surface with a hole proximate said ramp's lower terminus; with said envelope being of sufficient stiffness to atmospherically self-inflate, when unburdened, and to self-project its other of said two ends generally away from said ramp's lower terminus at a preselected distance, when unencumbered; and
(c) means for disposing said tray generally adjacent to, and underneath, said envelope, when said rods are to be loaded into said tray, for said rods to roll from said ramp onto said envelope pushing said envelope into contact with said tray, when said stop is disengaged, and for said envelope to lower said rods to the bottom of said tray as air is pushed out of said hole of said envelope by the weight of said rods thereon.

4,573,848

ARRANGEMENT FOR DISPENSING SHEETS FROM A STORE THEREOF, FOR EXAMPLE BANK NOTES

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

Filed Dec. 5, 1983, Ser. No. 558,106
Claims priority, application Sweden, Dec. 6, 1982, 8206935
Int. Cl.[4] B65H *31/30*
U.S. Cl. 414—104 **3 Claims**



1. An arrangement for dispensing sheets from a store (10) of sheets, for example bank notes, to one (11) of a plurality of withdrawal stations (11, 12), including first transport means (13–14) for transporting sheets from the store (10) to a collecting station (15), a plurality of so-called finger wheels (31, 32, 33) arranged immediately upstream of the collecting station (15), so as to reduce the speed of the sheets, and second transport means (16–17) for transporting the collected bundle of sheets from the collecting station (15) to the withdrawal station (11), said collecting station (15) comprising two mutually opposing walls (26, 27), between which the bundle of sheets is clamped during the initial stage of transportation from said collecting station (15) to said withdrawal station (11), characterized in that the walls (26, 27) are provided with wheels, rollers or the like (e.g., 261, 271) which are arranged to co-act with each other, two and two, one on each wall and which are arranged to transport the bundle of sheets in one of a number of possible directions, in dependence upon to which withdrawal station (11) of said withdrawal stations (11–12) the ordered sheets are to be dispensed and one of said walls is also formed as a sheet removal means (27) for co-action with the finger wheels (31, 32, 33) which project through openings (2720, 2740, 2760) in said wall (27) when said wall is turned from the collecting station (15) to the sheet removal position; and in that flaps (2721, 2741, 2761) are arranged to cover said openings (2720, 2740, 2760) when the wall (27) is pivoted to the collecting station (15), and comprises a wall defining said collecting station and the selected transport direction for the bundle of sheets is the same as the direction of the pivot axis of said wall.

4,573,849

SPOUT AIMER WITH FEED ROLL ROTATION SENSING

Stanley J. Johnson, Cedar Falls, and Gary L. Gold, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

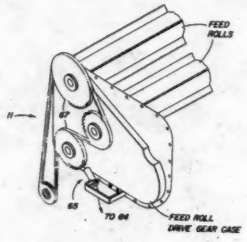
Continuation of Ser. No. 482,690, Apr. 6, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 756,919
Int. Cl.[4] B65G *67/22*
U.S. Cl. 414—334 **6 Claims**

1. In a forage harvester having rotatable feed rolls and a

movable spout for directing crop to a crop-receiving wagon coupled thereto, characterized by:

control means for automatically moving the spout to evenly fill the wagon, the control means comprising a sweep mode timer which expires after a predetermined time period and means for preventing automatic movement of the spout unless the sweep mode timer has expired;

rotation sensing means for sensing the rotation of the feed rolls; and



disable means for preventing automatic movement of the spout by the control means when the rotation sensing means detects that the feed rolls are rotating slower than a certain rotation speed, the disable means comprising means for periodically restarting the sweep mode timer to prevent expiration thereof unless the feed rolls are rotating faster than said certain rotation speed.

4,573,850

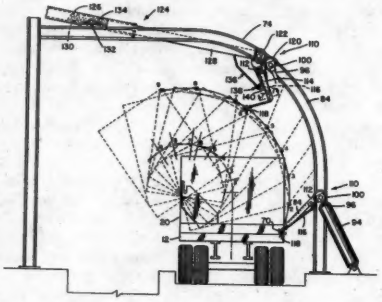
CONTAINER AND HANDLING APPARATUS THEREFOR

Diego R. Suarez, 6847 Granada Blvd., Coral Gables, Fla. 33146

Division of Ser. No. 578,013, Feb. 8, 1984, Pat. No. 4,527,939. This application Dec. 7, 1984, Ser. No. 679,216

Int. Cl.⁴ B65G *67/42*

U.S. Cl. 414—382 **6 Claims**



1. Container dumping apparatus comprising:

a. a guide rail extending upwardly adjacent to and over a vehicle carrying a tiltable container;

b. hook means for engaging a hooking bar extending from a container;

c. carriage means connected with said hook means, said carriage means supported for movement along said guide rail;

d. means for moving said carriage means along said guide rail with said hook means engaging a hook receiving means carried by a tiltable container from an initial position in which the container is upright and at rest, to a final position in which the container has been tilted about a tilt axis to dump the contents thereof; and

e. shock absorber means carried by said guide rail to engage said carriage means for providing resistance to movement of said carriage means in a tilting direction of said container to prevent a rapid forward jerking movement of the container after the center of gravity of the container passes through the highest point in its path of travel.

4,573,851

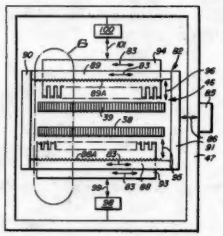
SEMICONDUCTOR WAFER TRANSFER APPARATUS AND METHOD

Robert M. Butler, Tempe, Ariz., assignor to Microglass, Inc., E. Syracruse, N.Y.

Filed May 18, 1983, Ser. No. 495,642

Int. Cl.⁴ B65G *65/04*

U.S. Cl. 414—404 **15 Claims**



1. A wafer transfer system for transferring semiconductor wafers between first and second wafer carriers, said system comprising in combination:

(a) carrier support means for receiving and supporting either of said first and second wafer carriers;

(b) elevator means for engaging lower edge portions of wafers in the one of said first and second wafer carriers then on said carrier support means and raising the wafers into a wafer holding region located above said one of said wafer carriers, and for engaging lower edge portions of wafers in said wafer holding region and lowering them into respective sets of grooves in the one of said first and second wafer carriers then on said carrier support means;

(c) first and second spaced groups of wafer supporting grooves in said elevator means, each wafer supporting groove of said first group being aligned with a corresponding wafer supporting groove of said second group to cooperate therewith in engaging lower edge portions of a wafer to support that wafer, wherein a first wafer supporting groove of said first group includes a first flat, vertical surface for engaging a first peripheral portion of a first face of a first wafer and a first steeply inclined surface opposed to said first flat vertical surface for supporting an edge point of said first wafer and exerting a horizontal force, due to the weight of said first wafer, that urges said first peripheral portion of said first wafer tightly against said first flat, vertical surface, and wherein a first wafer supporting groove of said second group includes a second flat, vertical surface for engaging a second peripheral portion of an opposite second face of said first wafer and a second steeply inclined surface opposed to said second flat, vertical surface for supporting another edge point of said first wafer and exerting a horizontal force, due to the weight of said first wafer, that urges said second peripheral portion of said first wafer tightly against said second flat, vertical surface, whereby said first wafer is held firmly in a precisely vertical position by said first wafer supporting grooves of said first and second groups, respectively, during upward and downward movement of said elevator means;

(d) first retaining means, movable into said wafer holding region while a first group of wafers is being held therein and having a plurality of grooves, for retaining said wafers

of said first group in said wafer holding region after said elevator means is lowered, and retractable from said wafer holding region to allow said wafers of said first group to be lowered from said wafer holding region by said elevator means, wherein said plurality of grooves of said first retaining means engage lower edges of respective wafers of said first group spaced from and adjacent to said edge portion engaged by said wafer supporting grooves; and

(e) second retaining means, disposed on an opposite side of said wafer holding region from said first retaining means, and having a plurality of grooves that are aligned with said plurality of grooves of said first retaining means, respective, edges of said wafers of said first group coming to rest in respective ones of said plurality of grooves of said second retaining means as said elevator means is lowered.

4,573,852

VIAL RUPTURING APPARATUS

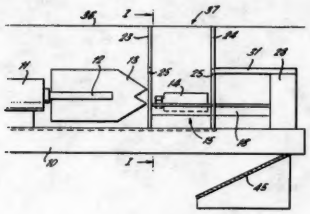
John H. T. Rinfret, and Elizabeth M. Rinfret, both of Grange Farm, Farthorpe, West Ashby, Horncastle, Lincolnshire, United Kingdom

Continuation of Ser. No. 407,938, Aug. 13, 1982, abandoned. This application Jan. 23, 1985, Ser. No. 693,822

Claims priority, application United Kingdom, Aug. 13, 1981, 8124807

Int. Cl.[4] B65B *69/00*

U.S. Cl. 414—412 **9 Claims**



1. An apparatus for rupturing an elongated plastic vial which has opposite first and second ends and a longitudinal central axis therethrough, said apparatus comprising

a support means comprising a pair of parallel, horizontally-oriented bars for supporting said elongated vial such that said longitudinal axis thereof is generally horizontally oriented, said bars defining a drainage channel therebetween,

a rupturing means for rupturing said elongated vial in parallel with its longitudinal central axis, said rupturing means consisting of a blade holder and a knife blade, said knife blade extending beyond said blade holder and towards the first end of said elongated vial, said knife blade having a sharpened edge facing said first end of said elongated vial,

an abutment means for contacting the second end of said elongated vial and preventing said elongated vial from sliding in a direction parallel to its longitudinal central axis as the knife blade of said rupturing means moves through said vial,

distance-reducing means for reducing the distance between said rupturing means and said abutment means to cause the knife blade of said rupturing means to rupture said elongated vial in parallel with its longitudinal central axis,

an upwardly-oriented flat sheet having an upper edge and a lower edge, the lower edge being connected to one of said pair of parallel, horizontally-oriented bars, and

a cassette means connected to the upper edge of said flat sheet, said cassette discharging individual elongated plastic vials onto said flat sheet to roll therealong into position on said pair of parallel, horizontally-oriented bars.

4,573,853

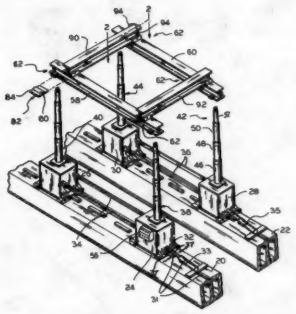
GANTRIES FOR HAULING HEAVY LOADS OVER FIXED PATHS

Gary Lorenz, 5206 37th Ave. Court, Moline, Ill. 61265

Filed Feb. 24, 1984, Ser. No. 583,468

Int. Cl.[4] B60P *3/00;* **B66C** *5/04*

U.S. Cl. 414—460 **10 Claims**



1. A gantry comprising at least four base members positioned at the corners of a generally rectangular pattern and adapted to move along at least two spaced parallel paths, tie rod means for assembling said four base members into two associated pairs, each of said pairs being positioned to follow an individually associated one of said paths, lifting means comprising at least one hydraulic ram extending perpendicularly upward from each of said base members, superstructure means generally forming a rectangular frame attached at its corners to the tops of said hydraulic rams for lifting a load within the space between said parallel paths which is straddled by said gantry, and coupling means in said superstructure for providing flexibility at each of the corners of said rectangular frame, said flexibility being along two perpendicular axes in a plane parallel to said two paths said superstructure comprises a first pair of spaced parallel beams pivotally coupled to the tops of said hydraulic rams with freedom to pivot up or down in a direction which is parallel to said paths, a second pair of spaced parallel beams resting on and extending between said first pair of beams thereby forming a generally rectangular frame, and rocker plate means comprising an arcuate segment of a cylinder positioned between the first and second of said beams at each point where a second beam rests on a first beam, the contours of said cylindrical segment enabling said superstructure to have approximately 10° freedom to rock side to side in directions which are perpendicular to said paths.

4,573,854

APPARATUS FOR LOADING A WHEELCHAIR OR SIMILAR OBJECT

Robert E. McFarland, 8301 NW. 39th Expressway, Bethany, Okla. 73008

Filed Dec. 23, 1983, Ser. No. 565,164

Int. Cl.[4] B60R *7/00*

U.S. Cl. 414—462 **60 Claims**

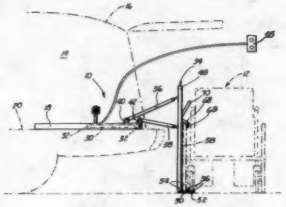
1. Apparatus for loading a wheelchair or other object into a rear compartment of a vehicle, said apparatus comprising:

a chassis adapted for attachment to a lower surface of said rear compartment, and having a forward portion and a rearward portion, and defining a plurality of spaced guide tracks;

a carriage comprising roller means including at least one roller in guided, rolling contact with a guide track of said chassis, such that said carriage may be rolled between forwardmost and rearwardmost positions in relation to said chassis;

a rack to hold the wheelchair or other object; and

rotatable linkage means pivotally connecting said rack to said carriage, whereby, as said linkage means is rotated in a substantially continuous forward pivotal motion during a loading cycle, said rack and the wheelchair or other object held thereon are raised from a substantially vertically oriented loading position at the rear of the vehicle in which said rack is adjacent a ground surface rearward of said vehicle to facilitate placement of the wheelchair or other object thereonto, forwardly pivoted through approximately 90°, passing through a point of maximum



elevation, and lowered to a substantially horizontal storage position in which said rack is adjacent and substantially parallel to said carriage and chassis in said compartment, said cycle being reversible for unloading;

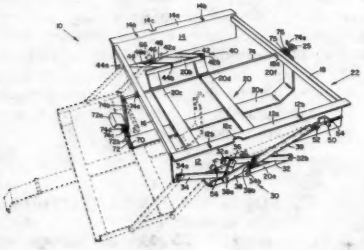
wherein said carriage passes through said rearwardmost position during said loading and unloading cycles, and when said rack and said chair or other object are in said storage position, said carriage, said rack and said chair, can be concurrently rolled to said forwardmost position for transport by said vehicle.

4,573,855

SWINGABLE TIRE CARRIER

Charles Braswell, Burnet, Tex., assignor to Tejas Designs, Inc., Burnet, Tex.

Filed Oct. 16, 1984, Ser. No. 661,457
Int. Cl.⁴ B62D *43/04*
U.S. Cl. 414—463 **6 Claims**



1. A tire carrier for use with a vehicle comprising:

a mounting frame attachable to an undersurface of the vehicle;

a tire receiving frame dimensioned to receive a tire usable on the vehicle;

pivotable means for interconnecting said tire receiving frame and said mounting frame such that said tire receiving frame is suspended below said mounting frame and is movable between a retracted, storage position and an extended, open position;

manually releasable latch means acting between said mounting frame and said tire receiving frame for retaining said tire receiving frame in said storage position, said latch means including

a rod pivotable about an axis parallel with the direction of movement of said tire receiving frame;

a lock bar carried by said rod at one end thereof and extending generally perpendicularly from said rod;

a hook carried by and movable with the other end of said rod;

means at one end of said tire receiving frame for engaging said hook in said storage position; and

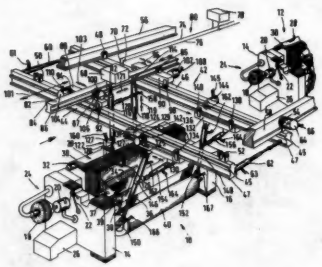
means at the other end of said tire receiving frame for engaging said lock bar when said rod is rotated such that said hook is engaged, whereby rotation of said rod is prevented until said lock bar is disengaged.

4,573,856

APPARATUS FOR LOGISTICAL OPERATIONS WITH TEXTILE MACHINERY

Wolfgang K. Meyer, Winterthur, and Fritz-Werner Breyer, Frauenfeld, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 20, 1983, Ser. No. 533,962
Claims priority, application European Pat. Off., Sep. 24, 1982, 82810399.4
Int. Cl.⁴ D03D *1/00*
U.S. Cl. 414—561 **13 Claims**



1. An apparatus for logistical operations with textile machinery, said apparatus comprising

a rack for mounting over at least one textile machine in movable relation, said rack including at least two parallel carrier beams, means for adjusting said carrier beams transversely relative to one another and a third beam mounted transversely of said adjustable carrier beams for movement longitudinally of said carrier beams;

at least one element movably mounted on and longitudinally of each carrier beam;

at least one operative device mounted on each said element for infeeding into a textile machine located below said rack;

at least two reciprocating actuators movably mounted on said third beam; and

second means for moving said actuators relative to each other longitudinally of said third beam.

4,573,857

VEHICLE TOWING MECHANISM

Calvin R. Porter, Sr., and Calvin R. Porter, Jr., both of Kansas City, Mo., assignors to Ready Built Tow Trucks, Inc., Kansas City, Mo.

Filed Jan. 17, 1983, Ser. No. 458,200
Int. Cl.⁴ B60P *3/12*
U.S. Cl. 414—563 **2 Claims**

1. A vehicle towing mechanism in combination with a truck having winch means for towing a vehicle; said vehicle towing mechanism comprising:

(a) a proximate support member pivotally connected to said

truck forward of a rear portion of said truck and extending rearwardly therefrom and longitudinally therewith;

(b) a first riser tube attached to said truck rear portion;

(c) a second riser tube telescopically received relative to said first riser tube so as to telescope along a generally vertical axis; said second riser tube having a clevis attached thereto and surrounding and supporting said proximate support member;

(d) means for selectively vertically locking said second riser tube in a telescoping position relative to said first riser tube;

(e) a sleeve member telescopically received relative to said proximate support member;

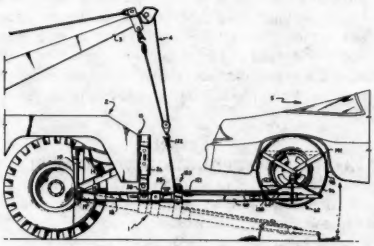
(f) an elongate main support member having a first end and a second end; said first end being telescopically received relative to said sleeve member and said proximate support member; said main support member including:

(1) an upper wall, a lower wall and spaced side walls interconnecting said upper and lower walls;

(2) said side walls being vertically aligned and formed of a high tensile steel and prestressed into a bowed configuration having an upward curvature in a vertical plane from a longitudinal center thereof toward said first and second ends thereof, respectively;

(3) said lower wall being fixedly attached to said side walls near a bottom thereof; and

(4) said upper wall being fixedly attached to said side walls near a top thereof after said side walls have been prestressed whereby said upper wall acts to retain said prestressed side walls in said bowed configuration;



(g) a wheel-supporting apparatus adapted for securely engaging and supporting a set of wheels of the vehicle to be towed, said wheel-supporting apparatus including:

(1) a pivotal adapter telescopically received relative to said main support member second end;

(2) a crossbar having first and second ends and a center section; said crossbar center section being swingably connected to said pivotal adapter and extending generally transversely therefrom to allow rotation of said wheel-supporting apparatus in a generally horizontal plane when said main support member is horizontally aligned;

(3) first and second transverse arm members telescopically received relative to said first and second crossbar ends respectively;

(4) first and second wheel-engaging devices connected to respective first and second arm members; each of said wheel-engaging devices having a rotating section and a fixed section; said fixed and rotating sections each having a longitudinal component and a transverse component;

(5) said wheel-engaging devices having a first position in which said rotating section transverse components are spaced from and generally parallel to respective fixed section transverse components and said longitudinal components are generally coaxial; said wheel-engaging devices when in said first position thereof defining wheel-receiving spaces;

(6) each of said wheel-engaging devices having a second position in which said rotating sections are rotated away from said wheel-receiving space such that a respective rotating section transverse component is positioned inwardly of a line projected through an inner edge of said fixed section longitudinal component;

(7) wheel-retention means comprising first and second chain units each including a hooking section and an extension section; each of said hooking sections being connected to a respective rotating section transverse component; each of said extension sections being attached to said crossbar center section and extending through a longitudinal bore in a respective fixed section transverse component and being adapted to respectively engage said chain hooking sections; and

(h) a lift mechanism including:

(1) a support cable having a first end and a second end; said cable first end being operatively connected to said tow truck winch means;

(2) a support peg attached to and extending upwardly from said pivotal adapter;

(3) sheave means attached to said sleeve member for guiding said support cable;

(4) said support cable extending through said sheave means and being connected to said support peg at said support cable second end, whereby the vehicle towing mechanism is lifted upon operation of the tow truck winch means.

4,573,858

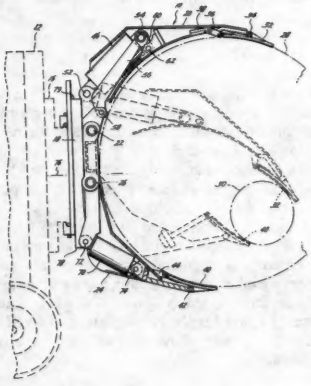
CLAMPING ATTACHMENT FOR A LIFT TRUCK HAVING TWO PIVOTING ARMS

Stuart W. Sinclair, Lake Jackson, Tex., assignor to Long Reach Manufacturing Co., Houston, Tex.

Filed Feb. 16, 1984, Ser. No. 580,990

Int. Cl.[4] B66C *1/42*

U.S. Cl. 414—620 **14 Claims**



1. A clamping attachment for use on a lift truck comprising,

a frame,

a first arm pivotally connected to the frame,

a second arm pivotally connected to the frame, said second arm being shorter than the first arm,

first and second hydraulic piston and cylinder means connected to the first and second arms, respectively, for moving said arms toward each other to close for clamping loads therebetween and away from each other to open to release loads,

said first and second hydraulic piston and cylinder means being connected in parallel whereby both arms simultaneously move inwardly until one arm contacts a load and

said one arm will stop and the other arm will continue inward movement, and

a biasing valve connected to said second hydraulic piston and cylinder means for initially preventing hydraulic fluid opening said second arm whereby on opening said arms the first arm opens while the second arm remains closed until the first arm completely opens, said biasing valve including a check valve for allowing the flow of hydraulic fluid from said second hydraulic piston and cylinder means.

4,573,859

APPARATUS FOR UNLOADING CURED TIRES FROM A TIRE VULCANIZING PRESS

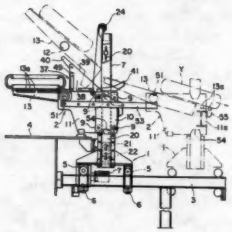
Itaru Amano; Yoshimata Maikuma, both of Kobe; Keiji Ozaki, Hyogo, and Hisaaki Ohnishi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 1, 1983, Ser. No. 470,949

Claims priority, application Japan, Mar. 2, 1982, 57-34165

Int. Cl.[4] B65G *61/00*

U.S. Cl. 414—628 **15 Claims**



1. An apparatus for unloading a cured tire from a tire vulcanizing press having a center forming mechanism, said apparatus comprising:

a movable tire support member tiltably mounted on a liftable support member and for supporting said cured tire thereon;

means for moving said movable tire support member horizontally toward and away from said center forming mechanism of said tire vulcanizing press and for receiving and unloading said cured tire;

means for tilting said movable tire support member toward a tire discharging side of said press at a lifted position over said center forming mechanism; and

a guide cam member mounted on said means for moving said movable tire support member for engaging said movable tire support member and for guiding said movable tire support member toward a lower tire discharge point in a predetermined tilted posture, said guide cam member including a first auxiliary cam plate connected thereto for selectively guiding movement of said movable tire support member.

4,573,860

EQUIPMENT FOR DISENTANGLING BARS

Rolf Peddinghaus, Deterberger strasse 25, 5828 Ennepetal, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,452

Int. Cl.[4] B65G *47/12*

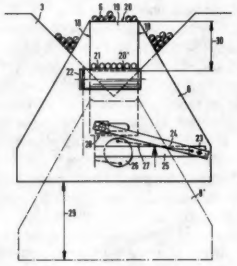
U.S. Cl. 414—745 **12 Claims**

1. In a device for disentangling elongated bars, including a plurality of relatively longitudinally spaced frames each extending at right angles relative to the length of the bars and each having an upwardly directed V-shaped cut-out, the V-shaped cut-outs being mutually aligned, and vertically liftable supports disposed between said frames, each support having a central portion extending vertically relative to the length of the bars and having a width which is less than the maximum width of said V-shaped cut-outs, the improvement comprising:

a downwardly extending slot through the central portion of each liftable support formed by downwardly extending opposed side walls and a bottom wall in each support;

a conveyor element mounted in each support and extending across the respective slot;

a bulkhead operatively mounted in each slot for vertical movement therein guided by said opposed side walls thereof between an upper position and a lower position;



a bottom edge on each bulkhead; and

an upper edge on each bulkhead which in said upper position forms the upper edge of the respective associated support for supporting bars thereon and in said lower position lies below the respective conveyor element, so that said opposed side walls of said slots define the lateral boundaries of a conveyor channel above said conveyor elements when said bulkheads are in said lower position.

4,573,861

APPARATUS FOR FEEDING SHEET METAL ELEMENTS TO A BENDING

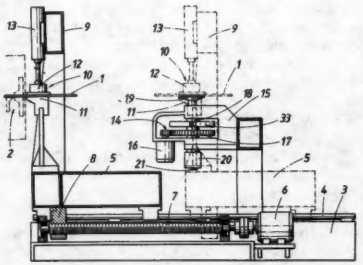
Johann Aschauer, Eferding, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 13, 1983, Ser. No. 503,793

Claims priority, application Austria, Jun. 23, 1982, 2420/82

Int. Cl.[4] B21D *43/11*

U.S. Cl. 414—751 **12 Claims**



1. An apparatus for feeding and rotating a sheet metal element, comprising the combination of

(a) a frame,

(b) a carriage displaceably mounted on said frame for feeding the sheet metal element,

(c) gripping means operable to grip the sheet metal element in a predetermined plane, said gripping means including

(1) a non-rotatable gripping jaw mounted on said carriage,

(2) a rotary backing jaw mounted on said frame indepen-

dently of said carriage and rotatable about an axis extending perpendicularly to said plane, and

(3) a rotary gripping jaw carried by said frame independently of said carriage, movable perpendicularly to said predetermined plane and rotatable about said axis, said non-rotatable gripping jaw and said rotary gripping jaw being adapted selectively to cooperate with said rotary backing jaw to grip said sheet metal element therebetween,

(d) actuating means operable in alternation to force said backing jaw selectively against the non-rotatable gripping jaw or to move the rotary gripping jaw perpendicularly to said predetermined plane against said rotary backing jaw to grip said sheet metal element therebetween, the actuating means comprising

(1) a first element connected to said rotary gripping jaw and

(2) a second element arranged to engage said carriage when said actuating means is operated while said carriage is in said predetermined position,

(3) the first and second elements being movable relative to each other perpendicularly to said predetermined plane, and

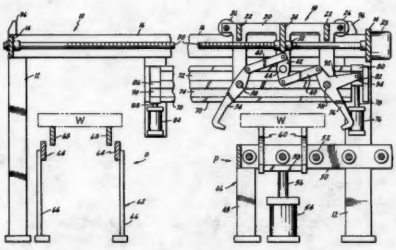
(e) rotary drive means mounted on said frame independently of said carriage and operable to rotate said rotary gripping jaw when said sheet metal element is gripped between the rotary gripping and backing jaws.

4,573,862

WORKPIECE TRANSFER DEVICE

Paul L. Anderson, Trenton, Mich., assignor to Lamb Technicon Corp., Warren, Mich.

Filed Sep. 24, 1984, Ser. No. 653,360
Int. Cl.[4] B65G *25/04*
U.S. Cl. 414—753 **11 Claims**



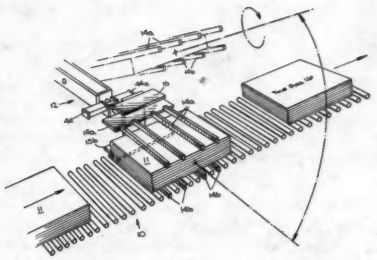
1. A device for transferring workpieces from a first station to a second station comprising a support, guide means on said support extending between said stations, a workpiece carrier movable on said guide means between said stations, a workpiece gripper on said carrier and movable therewith, means for actuating said gripper to a work gripping position when the carrier is adjacent said first station and thereby grip a workpiece at said first station for transfer to the second station, means for actuating said gripper to a work-releasing position when the carrier reaches the second station to release the workpiece at said second station, a track fixed on said support and extending along a path generally parallel to said guide means, a follower mounted on said carrier for translatory movement therewith, said follower being operatively connected with the work gripper and shiftable by said actuating means between a first position wherein the work gripper is actuated to the work-gripping position and a second position when the work gripper is actuated to the work-releasing position, said follower when in said first position being engagable with said track upon movement of the carrier from said first to said second station and in said second position being disengaged from said track upon movement of the carrier from said second to said first station, said follower being locked against shifting movement when engaged with said track to retain said work gripper in said work gripping position.

4,573,863

FLUID DRIVEN TUBE POSITIONER

Ronald T. Picotte, Murray, Utah, assignor to St. Regis Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,888
Int. Cl.[4] B65G *47/24*
U.S. Cl. 414—763 **5 Claims**



1. A tube positioner for inverting a hand of tubes resting on a surface, comprising:

clamp means for engaging opposed surfaces of the hand of tubes including a U-shaped frame, a guide bar having its opposite ends connected to the legs of the frame, and two sets of clamp arms carried by the frame and adapted to engage the opposed surfaces of the hand of tubes, one set of clamp arms being mounted on the guide bar for reciprocating movement therealong parallel to the other set of clamp arms;

means for elevating and lowering the clamp means relative to said surface, after both sets of clamp arms engage the hand of tubes, along a first reference axis extending in a vertical direction;

means for tilting the clamp means in its elevated condition, prior to inverting the hand of tubes, about a second reference axis extending perpendicular to the first reference axis and for returning the clamp means to its non-tilted condition after inverting the hand of tubes;

means for inverting said clamp means and the hand of tubes engaged thereby about a third reference axis extending perpendicular to the second reference axis; and

means for releasing said clamp means from the hand of tubes to deposit the inverted hand of tubes on the surface.

4,573,864

REGENERATIVE TURBOMACHINE

Alan Moore, 4 Partickhill Ave., Glasgow G11 5AA, Scotland

Filed Aug. 15, 1984, Ser. No. 640,852
Claims priority, application United Kingdom, Aug. 19, 1983, 8322367
Int. Cl.[4] F04D *5/00*
U.S. Cl. 415—53 T **8 Claims**

1. A regenerative turbomachine comprising

a bladed rotor;

an annular housing surrounding the rotor and defining an annular flow channel for a working fluid;

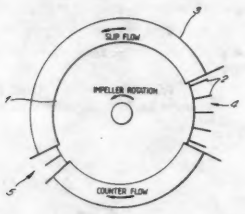
an inlet port for admitting the fluid to the housing;

an outlet port spaced circumferentially of the rotor from the inlet port, by which the fluid can leave the housing;

and guide means for guiding the fluid entering the inlet port through a slip flow path and a counter-flow path, each flow path making successive passes through the blading in a generally axial sense,

wherein in the slip flow path successive passes are made

which reintroduce the fluid to the rotor blades at circumferential positions spaced successively in the direction of intended rotor rotation, and



in the counter flow path successive passes are made which reintroduce the fluid to the rotor blades at circumferential positions spaced successively in the direction counter to the intended direction of rotor rotation.

4,573,865

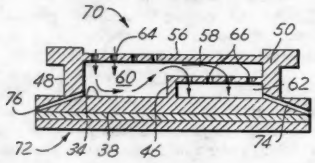
MULTIPLE-IMPINGEMENT COOLED STRUCTURE

Edward S. Hsia, Cincinnati; Raghuram J. Emani, and John H. Starkweather, both of West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 297,688, Aug. 31, 1981, Pat. No. 4,526,226. This application Apr. 2, 1984, Ser. No. 595,754

Int. Cl.[4] F02C 7/18; F04D 29/58; F01D 25/12

U.S. Cl. 415—115 **4 Claims**



1. In a shroud which defines a flowpath for hot gases in a gas turbine engine, the improvement comprising:

(a) means for directing airstreams against a first shroud portion for impingement cooling thereof and

(b) means for collecting some of the air of (a) after impingement and redirecting the collected air against a second shroud portion for impingement cooling thereof.

4,573,866

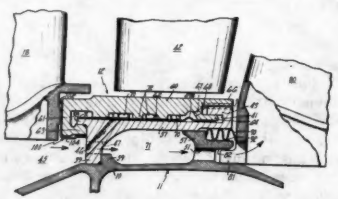
SEALED SHROUD FOR ROTATING BODY

James J. Sandy, Jr., Palm Beach Gardens, Fla., and Brian P. Huth, East Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,696

Int. Cl.[4] F01D 25/24

U.S. Cl. 415—116 **11 Claims**



1. In combination with a turbine assembly mounted in an outer casing, a shroud for surrounding a stage of turbine blades between stationary inlet and outlet vanes, said shroud construction comprising a tip shroud support ring extending around the tips of the turbine blades and fixedly positioned on the outer engine casing, a plurality of tip shroud members mounted on the inner circumference of said shroud support ring, passageway means for directing a cooling fluid between said shroud support ring and said tip shroud members, the forward inner end of said shroud support ring having a cylindrical flange extending therefrom, the forward ends of each of the tip shroud members having attaching means slideable over said cylindrical flange, means attaching said rearward ends of said tip shroud members to said tip shroud support ring, an annular metal can positioned over the forward ends of said tip shroud members and enclosing them while the rearward edge of the can engages said tip shroud support ring to form a seal and prevent flow therebetween.

4,573,867

HOUSING FOR TURBOMACHINE ROTORS

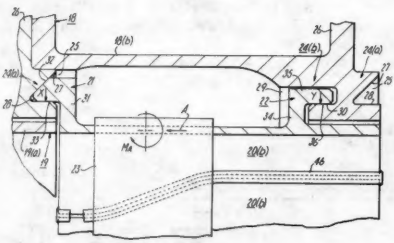
Derek G. Hand, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 22, 1982, Ser. No. 443,609

Claims priority, application United Kingdom, Nov. 26, 1981, 8135783

Int. Cl.[4] F01D 25/26

U.S. Cl. 415—134 **18 Claims**



1. A housing for a rotor of a turbomachine comprising: radially spaced inner and outer casings, the inner casing comprising a segmented hollow cylinder each segment of which has one or more stator vanes projecting radially inwards, the inner casing being located relative to the outer casing by two or more axially spaced sets of fixing devices; each fixing device comprising a pair of locating means one of which is provided on the outer casing and the other of which is provided on each segment of the inner casing, one of the locating means of each fixing device of a first of the sets being provided with a first surface inclined to a direction extending axially along the casings and a second surface that constitutes a sealing face which lies at an angle to the first surface, and the other locating means of each fixing device of the first set being provided with third and fourth surfaces that confront and engage respectively the said first and second surfaces; one of the locating means of each fixing device of a second of the sets being provided with a fifth surface and the other locating means of each pair of the second set having a sixth surface that confronts, engages, and is movable axially relative to the fifth surface, the first, second, third, fourth, fifth and sixth surfaces all being positioned, shaped, and arranged, relative to each other so that, in use, gas loads acting on the vanes urge the segments in an axial direction and thereby urge the third surface into contact with the first surface and cause the segments to slide in a direction along the incline of the first surface to urge the fourth and sixth surface into sealing contact with respectively the second and fifth surfaces, thereby providing a sealing means at each locating means.

4,573,868

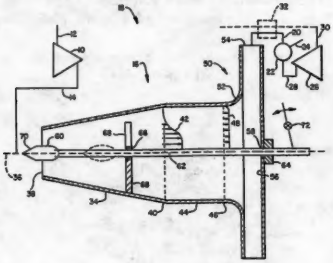
HIGH AREA RATIO, VARIABLE ENTRANCE GEOMETRY COMPRESSOR DIFFUSER

Sigmunn Stroem, Kongsberg, and Rolf J. Mowill, Oslo, both of Norway, assignors to A/S Kongsberg Vapenfabrikk, Norway

Division of Ser. No. 438,990, Nov. 4, 1982. This application Feb. 6, 1984, Ser. No. 577,383

Int. Cl.[4] F04D *29/56*

U.S. Cl. 415—157 8 Claims



1. Diffuser apparatus for use in combination with a rotary compressor having an axis of rotation, the apparatus comprising a plurality of individual diffuser assembly means for collectively controlling the gas mass flow rate through the compressor, said plurality of diffuser assembly means being spaced about the axis of rotation, each of said diffuser assembly means including

(a) a pipe diffuser first stage having an axis and a cross-sectional flow area smoothly increasing in the direction of flow, said first stage also having an entrance for receiving gas at a relatively high velocity from the compressor and also having an exit; and

(b) means for adjustably varying the first stage flow area, wherein said area varying means includes:

(i) a spike member having a contoured axisymmetric face with an axially-varying cross-sectional area; and

(ii) means for slidably positioning said spike member in said increasing area first stage and along the first stage axis for presenting said contoured face to oppose the gas flowing in the entrance to said first stage, to selectably vary the flow area of said first stage.

4,573,869

BLOWER

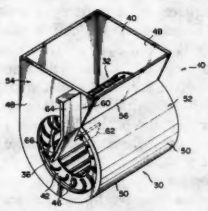
Manabu Kitamoto, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 15, 1983, Ser. No. 514,030

Claims priority, application Japan, Jul. 21, 1982, 57-127116

Int. Cl.[4] F04D *29/44, 29/66*

U.S. Cl. 415—182 7 Claims



1. A blower comprising:

a sirocco fan of substantially cylindrical shape and having a central axis;

driving means for rotating the fan around said central axis;

a fan case including a containing portion of substantially cylindrical shape for coaxially containing the fan, a circular inlet opposite to one axis end of the fan and a guide portion extending from the containing portion and defining an outlet at its extended end, and a casing nose defined in the boundary between the containing portion and the guide portion, wherein air is sucked through the inlet into the case and diffused from the outlet by the rotation of the fan;

a first wind direction plate mounted on the outer surface of the case for straightening the flow of the air from the exterior of the fan case into the inlet, the first wind direction plate having a portion which extends from near the center of the inlet toward the casing nose; and

a second wind direction plate for straightening the flow of the air at suction and discharge regions in the fan case, said second plate extending from the first plate through the inlet into the fan along the axial direction of the fan and radially extending substantially from the center of the fan toward the casing nose.

4,573,870

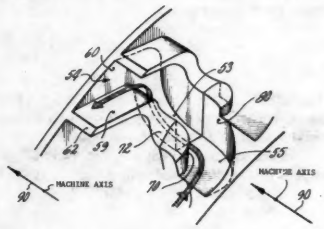
SOLID TURBINE WHEEL WITH GUIDED DISCHARGE

Zaher M. Moussa, Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Oct. 26, 1984, Ser. No. 665,246

Int. Cl.[4] F01D *1/02*

U.S. Cl. 415—202 10 Claims



1. An impulse-type turbine having an inlet and an outlet with a flow path therebetween, a nozzle ring and a turbine wheel which comprises:

said turbine wheel having first and second circumferential rim portions of varying diameter each of a predetermined width with a plurality of uniformly spaced, overlapping buckets formed around said rim portions;

each of said buckets defining a first generally half U-shaped passageway having a leg portion, and a curved portion connected to the leg portion, a second generally half U-shaped portion connected to the curved portion, an L-shaped passageway extending from the second half U-shaped portion to the second rim portion and said leg portion extending to the first rim portion of the wheel;

a solid center portion defined by the passageways of the adjacent buckets; and

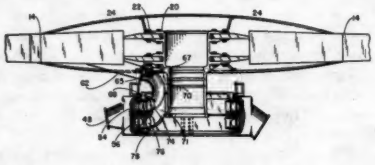
labyrinth sealing means circumferentially extending about said rim portion and coacting with said center portions to provide a fluid seal between said leg portion which defines an inlet fluid path and the L-shaped portion which defines an outlet fluid path within the bucket.

4,573,871

X-WING AIRCRAFT CIRCULATION CONTROL

Timothy A. Krauss, Harwinton, and Leo Kingston, Stratford, both of Conn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1984, Ser. No. 645,469
Int. Cl.[4] B64C 27/18
U.S. Cl. 416—20 R 3 Claims



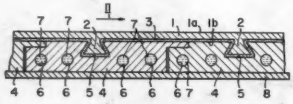
1. In (1) a circulation control rotor system for a helicopter having (a) air ejection slots and circulation control air passageways in its rotor blades for achieving cyclic control by ejected airflow around each rotor blade, (b) a stationary airflow plenum in its hub having ports therein for airflow therefrom, (c) rotating air ducts having input ends in alignment with the plenum ports, and opposite ends connected to the rotor blade air passageway for conducting plenum airflow from the ports to the rotor blade ejection slots, and (d) a series of control valves in the plenum airflow ports for governing airflow to the rotating air ducts as the ducts pass each valve in sequence azimuthally around the hub, (2) means for preventing loss of plenum pressure in the event of a blade air pressure loss including means sensing air pressure in the rotating air duct for each blade, and means comparing the sensed rotating air duct pressure with pressure at the control valves, the means for preventing loss of plenum pressure further including a closure means disposed in each rotating air duct, capable when activated of cutting off airflow into the rotating duct, and means activating said closure means in response to a comparing means signal from the means for comparing.

4,573,872

HIGH TEMPERATURE HEAT RESISTANT STRUCTURE

Yuji Nakata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 26, 1983, Ser. No. 545,646
Claims priority, application Japan, Dec. 27, 1982, 57-232318
Int. Cl.[4] F01D 5/8; F28F 7/02
U.S. Cl. 416—96 A 5 Claims



1. A heat resistant structure adapted to be used in a passage through which flows a high temperature fluid, comprising:

a heat resistant metal plate having a smooth outer surface exposed to the fluid;

a layer of ceramic fiber material having a high heat transmission resistance extended along an internal surface of said metal plate;

a plurality of heat conductive bodies each spaced apart from adjacent bodies and each located in close contact with said ceramic fiber layer on a side thereof away from said metal plate, each of said heat conductive bodies being provided with a portion which is in slidable contact with a corresponding portion of the adjacent bodies; and

a plurality of passages provided through each of said heat conductive bodies for passing a coolant therethrough,

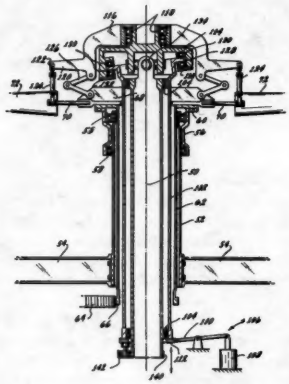
said heat resistant metal plate being provided with a plurality of projections on said internal surface thereof and each of said plurality of heat conductive bodies being provided with a recess engageable with respective ones of said plurality of projections with said ceramic fiber layer being interposed between each projection and respective recess.

4,573,873

COLLECTIVE AND CYCLIC IN-MAST PITCH CONTROL SYSTEM FOR A HELICOPTER

Samuel S. Yao, Fountain Valley, and Samuel K. F. Chu, Harbor City, both of Calif., assignors to Hughes Helicopters, Inc., Culver City, Calif.

Filed Jan. 13, 1983, Ser. No. 457,695
Int. Cl.[4] B64C 27/74
U.S. Cl. 416—114 14 Claims



1. An apparatus for control of a rotary blade system in a helicopter having a fuselage including a plurality of controllable rotor blades comprising:

a stationary mast extending from said fuselage of said helicopter characterized by a longitudinal axis;

a collective pitch control tube disposed within said stationary mast and concentric therewith, said collective pitch control tube having an upper flange defining a first plane inclined at an angle with respect to said longitudinal axis, said collective pitch control tube longitudinally displaceable within said mast;

a cyclic pitch control tube disposed within said stationary mast;

a first swashplate coupled to said cyclic pitch control tube, said first swashplate rotatably fixed to said cyclic pitch control tube about said longitudinal axis and rotatably free with respect to said cyclic pitch control tube about all axes of rotation perpendicular to said longitudinal axis, said first swashplate also slidingly coupled to said upper flange of said collective pitch control tube through a lower flange, said lower flange being inclined with respect to said first swashplate by an angle equal to said inclination of said upper flange of said collective pitch control tube, said first swashplate and cyclic pitch control tube rotatable about said longitudinal axis with respect to said collective pitch control tube and said upper flange thereof, the inclination of said first swashplate being determined by the relative angular position of said first swashplate with respect to said inclined upper flange of said collective pitch control tube;

bearing means for providing a low friction, rotatable coupling between said first swashplate and said upper flange, said bearing means being disposed in said first swashplate in a second plane inclined with respect to said longitudinal axis;

a drive shaft disposed within said stationary mast and connected to said plurality of rotor blades for imparting rotary motion to said plurality of rotor blades when said drive shaft is rotated; and

pitch linkage means for coupling said first swashplate to said plurality of rotor blades to control the pitch of said blades and wherein said pitch linkage means is coupled to said first swashplate so that inclination of said first swashplate with respect to said longitudinal axis of said mast causes the pitch of said rotor blades to be cyclically changed, and so that longitudinal displacement of said swashplate causes the pitch of said rotor blades to be collectively controlled,

whereby accurate control of said rotor blades is obtained without substantial feedback of reversible control forces transmitted therethrough, whereby stiffness of said control system is increased allowing more accurate blade control, whereby the number of parts and connections are reduced for increased reliability, whereby damage vulnerability is decreased, and whereby air drag is substantially reduced due to higher compactness of said apparatus.

4,573,874

SPRING BIASED BAYONET COUPLING FOR FAN BLADES

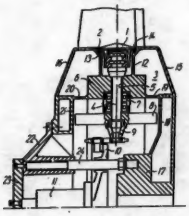
Steen H. Andersen, Naestved, and Bendt O. Pedersen, Karrebaeksminde, both of Denmark, assignors to Nordisk Ventilator Co. A/S, Naestved, Denmark

Filed Oct. 5, 1984, Ser. No. 657,902

Claims priority, application Denmark, Oct. 7, 1983, 4631/83

Int. Cl.[4] F04D *29/36*

U.S. Cl. 416—157 R **4 Claims**



1. A blade with a blade shaft (4) for an impeller of an axial flow fan, said impeller having a wheel rim (3), in which a number af blades are rotatably journalled each with a blade root (1; 48) connected with the blade shaft (4), the blade shaft being connected inside the wheel rim with a common adjusting device (10) for turning all the blades around the axes of the blades and blade shafts during rotation of the impeller, characterized in that the blade and the blade shaft (4; 51) are connected by bayonet engagement between these two elements, whereby a part (4; 49) of one element forming a bayonet plug member has at least one pair of opposed cam portions (28, 29; 52, 53) at a distance from its external end, which forms a smooth guide portion (25; 54), said cam portions being adapted for engagement with recesses (30, 31; 55, 56) formed in a bore (27; 57) in a part (1; 50) of the other element forming a bayonet socket member and extending between a bottom portion serving as a fit bore (26) for said smooth guide portion (25; 57) and a pair of opposed internally projecting shoulder portions (32, 33), said recesses (30, 31; 55,56) being formed with a play in the axial direction relative to the axial length of the cam portions (28, 29; 52, 53) of the bayonet plug member, at least two fixation screws (34, 35; 61, 62) extending from the external side of the blade root (1) through threaded bores (36, 37; 63, 64) in the wall of the blade root (1; 48) for insertion of their ends forming smooth guide portions (38, 39) into fit bores (40, 41; 59, 60) in a centering portion (42; 50) of the blade shaft (4) and having inwards relative to said guide portions (38, 39; 59, 60) a shoulder portion (43; 65) for abutment against a spring member (44; 66) arranged between the blade root (1; 48) and the side of said centering portion (42; 50) facing the blade root.

4,573,875

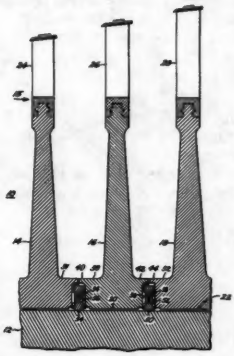
CAPTURED RADIAL KEY FOR STEAM TURBINE WHEELS

Eloy V. Emeterio, Amsterdam; Robert E. Deallenbach, Schenectady; Martin F. O'Connor, Scotia, and Oleg Klufas, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 29, 1984, Ser. No. 615,016

Int. Cl.[4] F01D *1/02*

U.S. Cl. 416—198 A **10 Claims**



1. In a steam turbine, a rotor comprising:

a rotatable shaft;

a plurality of wheels axially spaced along said shaft and respectively affixed to said shaft by an interference shrink-fit between the respective radially inner surface of said wheels and said shaft, each wheel of said plurality of wheels carrying a plurality of circumferentially aligned steam turbine blades at the radially outermost portion of said wheel, at least two adjacent wheels, each of said at least two adjacent wheels respectively comprising:

a hub section at the radially inner portion of the wheel, said hub including a substantially circumferential, axial end face surface at each axial end of the hub, whereby the axial end face surface of one of said at least two adjacent wheels opposes an axial end face surface of the next adjacent one of said at least two adjacent wheels to form a pair of corresponding opposing axial end face surfaces;

a circumferential lip axially extending from the axial end face surface opposing the axial end face surface of the next adjacent wheel, the axially outboard portion of said lip being in close proximity to the corresponding axially outboard portion of the lip on the opposing axial end face surface of the next adjacent wheel;

a pair of axially extending, arcuately spaced apart lands disposed ou the axial end face which includes said lip, said pair of lands forming a substantially radial slot therebetween, each pair of lands disposed intermediate the radially inner portion of said lip and the radially inner portion of said hub, radial slots on each opposing end face surface of said pair of axial end face surfaces axially aligned to form a substantially radial keyway between said at least two adjacent wheels;

a substantially I-beam shaped key, said key including respective upper and lower lateral extensions respectively extending in opposite directions from said key, disposed in said keyway, said key further including a leading and a trailing face and a respective concave portion intermedi-

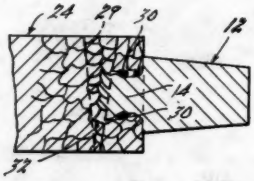
ate respective upper and lower lateral extensions, respective concave portions of said key mating with the corresponding radial slot which forms said keyway, respective upper and lower lateral extensions of said key including respective outboard surfaces contacting radially outer and inner portions of respective axial end faces of said pair of corresponding opposing axial end face surfaces, said key further including upper radial extremity extending radially from said upper lateral extensions, respectively, said upper radial extremity respectively contacting a radially inner portion of at least one of said lips of said pair of corresponding opposing axial end face surfaces and said lower radial extremity in close proximity to said shaft, respectively, and a respective leading and trailing face of said key contacting respective leading and trailing sidewalls of said keyway, respectively, and said key preventing rotation of one said adjacent wheel relative to the other said adjacent wheel.

4,573,876

INTEGRAL BLADED DISK

Michael J. Egan, Milford, and Gary J. Quill, Birmingham, both of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Division of Ser. No. 466,168, Feb. 14, 1983, Pat. No. 4,538,331.
This application Oct. 4, 1984, Ser. No. 657,599
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—213 R **1 Claim**



1. A turbine rotor comprising
a plurality of blades having dovetails at the radially inner ends thereof,
a metallic hub cast about the dovetails of said blades,
a Ni-Cr-B diffusion bonding material interposed between the dovetails of said blades and said hub, and
an electron beam weld zone comprising columnar grains extending axially of said turbine rotor and radially limited so as to include only the radially inner end portions of the dovetails of said blades and the adjacent portions of said hub.

4,573,877

APPARATUS FOR ELEVATING LIQUIDS INCLUDING A PAIR OF VENTURI PIPES HAVING WIND AS MOTIVE FLUID

Iosif Baumberg, Brooklyn, N.Y., assignor to Dammin Software and Technology Inc., Fair Lawn, N.J.

Filed Feb. 12, 1985, Ser. No. 700,960
Int. Cl.[4] F04B *23/04;* **F04F** *5/00*
U.S. Cl. 417—76 **5 Claims**

1. An arrangement for elevating liquids, comprising
a substantially vertical delivery pipe having a lower end and an upper end;
a first Venturi pipe extending substantially horizontally and having an inlet diffuser for receiving wind, and a constriction connected with said upper end of said delivery pipe, and an outlet diffuser;
a substantially vertical liquid supply pipe located lower than said delivery pipe and having a lower end to be introduced into a liquid, and an upper end;
a second Venturi pipe extending substantially horizontally and having an inlet diffuser open to atmosphere, a constriction connected with said upper end of said supply pipe, and an outlet diffuser; and
a connecting pipe which connects said outlet diffuser of said second Venturi pipe with said lower end of said delivery

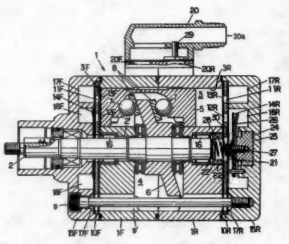
pipe so that said lower end of said delivery pipe is located lower than said outlet diffuser of said second Venturi pipe whereby a composite column of portions of liquid and air exists in the delivery pipe during operation of said arrangement.

4,573,878

VARIABLE-DELIVERY COMPRESSOR

Makoto Ohno; Hisao Kobayashi, and Kimio Kato, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 14, 1984, Ser. No. 620,463
Claims priority, application Japan, Jun. 24, 1983, 58-98348[U]
Int. Cl.[4] F04B *1/18, 1/28*
U.S. Cl. 417—270 **6 Claims**



1. A variable-delivery compressor comprising:
a cylinder block having compression chambers;
compression means including a drive shaft, a swashplate fixed to said drive shaft, and double-headed pistons which engage said swashplate and are slidably reciprocated in said compression chambers to compress a gas therein;
a front and a rear side cover disposed at opposite ends of said cylinder block, and defining a front and a rear discharge chamber, respectively;
a front valve plate having front discharge ports communicating with front halves of said compression chambers and said front discharge chamber;
a rear valve plate having rear discharge ports communicating with rear halves of said compression chambers and said rear discharge chamber;
a plurality of discharge valves of a reed type disposed opposite to said front and rear discharge ports, respectively, each of said discharge valves having generally elongated shape with one end portion thereof operable to close and open a corresponding one of said front and rear discharge ports; and
an actuator member disposed at one end of said front and rear discharge chambers which serves as a delivery-adjusting discharge chamber for adjusting a delivery of

the compressor, said actuator member holding said discharge valves associated with said delivery-adjusting discharge chamber, said actuator member being movable between an operative position adjacent the corresponding valve plate, at which said discharge valves are operative, and an inoperative position spaced away from said operative position, at which said discharge valves are inoperative,

said corresponding valve plate associated with said delivery-adjusting discharge chamber having a pressure relief opening which is opposite to said actuator member and which communicates with a suction space and said delivery-adjusting discharge chamber, said suction space being formed in said cylinder block and communicating with an inlet for introducing the gas into said compression chambers,

said plurality of discharge valves held by said actuator member being formed as an integral delivery-adjusting valving member, said valving member comprising a base portion fixed to said actuator member and closing said pressure relief opening when said actuator member is placed in said operative position, said valving member further comprising a plurality of generally elongated valving portions which extend from said base portion radially of the base portion and which are spaced from each other circumferentially of said actuator member, a free end part of each of said valving portions serving as said one end portion of said of said plurality of discharge valves,

said corresponding valve plate comprising, between said pressure relief opening and said discharge ports, portions defining a plurality of mutually independent arcuate recesses respectively opposite to each of said generally elongated valving portions of said delivery-adjusting valving member, said arcuate recesses extending only partially into the thickness of said corresponding valve plate and being spaced from each other along a circle concentric with said pressure relief opening, each of said arcuate recesses being open at opposite ends thereof to said delivery-adjusting discharge chamber even while said valving portions of the delivery-adjusting valving member are held in contact with said corresponding valve plate.

4,573,879

ROTARY COMPRESSOR

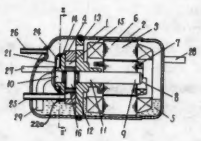
Toshio Uetuji, Hirakata, and Noriaki Ohkubo, Fujisawa, both of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

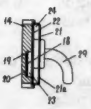
Filed Jun. 21, 1984, Ser. No. 623,224

Claims priority, application Japan, Jun. 24, 1983, 58-114543; Sep. 5, 1983, 58-163575

Int. Cl.⁴ F04B *21/00*

U.S. Cl. 417—312 **11 Claims**





1. A rotary compressor, comprising:

a motor unit including a stator and rotor;

a compressor mechanism section including

a cylinder having a first side facing said motor unit and a second side opposite said first side,

a rotary piston rotationally mounted in said cylinder,

a first bearing between said motor unit and said cylinder, and

a second bearing at said second side, said first and second bearings respectively covering said first and second sides of said cylinder, said second bearing having a first face facing said cylinder, a second face opposite said first face, a concavity opening into said second face, and a valve hole extending from said concavity to said second side of said cylinder so as to provide communication therebetween;

a motor operated compressor element including a crankshaft interlocking said motor unit and said compressor mechanism section such that said rotary piston is rotationally driven in said cylinder by said motor unit through said crankshaft;

a case enclosing said motor unit, said compressor mechanism section and said element;

a discharge valve element over said valve hole filling part less than all of said concavity;

a diaphragm covering said second face of said bearing, including said concavity; and

a discharge cover covering said diaphragm so as to define therebetween a discharge chamber for receiving pressurized gas therein, said diaphragm having a permanently open diaphragm hole therein in the proximity of said valve hole, so as to provide communication therethrough between said concavity and said discharge chamber, whereby the portion of said concavity not filled by said discharge valve element and said diaphragm define muffler means for muffling sounds of said compressor.

4,573,880

HERMETICALLY SEALED MOTOR COMPRESSOR

Yutaka Hirano; Hirokazu Kawakami, both of Ota; Masaaki Tanaami, Oramachi; Motohiko Kosano; Hiroshi Takagi, both of Isezaki; Yoshio Ishiai, Ota, and Ituo Iwahashi, Chiyodamachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of Japan

Continuation of Ser. No. 442,138, Nov. 16, 1982, abandoned. This application Mar. 4, 1985, Ser. No. 707,187

Claims priority, application Japan, Sep. 2, 1982, 57-153723; Sep. 2, 1982, 57-153725

Int. Cl.⁴ F04B *39/00*

U.S. Cl. 417—312 **10 Claims**

1. A hermetically sealed motor compressor having high volumetric efficiency, said compressor comprising:

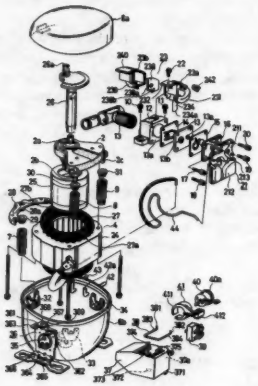
a casing including a suction coupling having an open end within said casing,

a compressor mounted in said casing, including a cylinder and a piston reciprocatingly slidable in said cylinder, said cylinder including a head plate with a suction hole and a discharge hole, said head plate comprising a stamped out metal plate and a valve plate, said cylinder further including a dish-shaped member attached to the stamped out metal plate and defining therewith a discharge valve chamber, said dish-shaped member being configured to cover said discharge hole without covering said suction hole,

a suction muffler formed of a material having a low coefficient of thermal conductivity, the suction muffler having a suction port, said suction port being in close spaced relation to the open end of said suction coupling for drawing said refrigerant gas into said suction muffler, and

a connection pipe formed of a material having a low coefficient of thermal conductivity, said connection pipe directly connecting said suction muffler to said cylinder through said suction hole of said head plate for transmitting said refrigerant gas from said suction muffler directly to said cylinder, said connection pipe having a distal end, the

distal end being inserted into said suction hole of said head plate, said distal end having no contact with said dish-shaped member, thereby avoiding heat transfer from hot



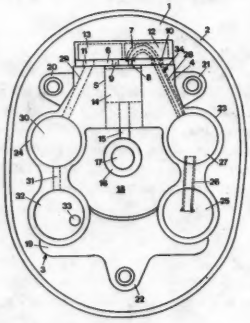
compressed refrigerant gas in said cylinder and dish-shaped member to said refrigerant gas in said connection pipe for improving the volumetric efficiency of said motor compressor.

4,573,881

REFRIGERATION COMPRESSOR HAVING A TUBULAR INSERT OF THERMALLY INSULATING MATERIAL IN SUCTION PASSAGE

Bendt W. Romer, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 642,077, Aug. 20, 1984, abandoned.
This application May 20, 1985, Ser. No. 736,271
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332259
Int. Cl.[4] F04B *39/12*
U.S. Cl. 417—312 **10 Claims**



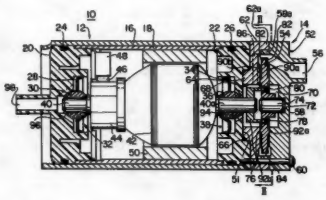
1. An encapsulated refrigerator motor compressor, comprising, a capsule, a compressor unit resiliently mounted in said capsule, a cylinder block casting for said compressor unit, said casting defining a cylinder chamber for receiving a piston and a sound damping chamber, means attached to said casting forming pressure and suction valve chambers adjacent the outer end of said cylinder, valve plate means between said chambers and said cylinder, a suction gas inlet passage in said casting adjacent said cylinder and extending between said sound damping chamber and said suction valve chamber, and insulation means for reducing the transfer of heat to suction gas in said suction gas inlet passage and in said suction valve chamber, said insulation means comprising said valve plate means including a suction valve orifice between said suction valve chamber and said cylinder and a suction passage orifice between said suction valve chamber and said suction gas inlet passage, a tubular insert of thermally insulating material inserted in said suction gas inlet passage and extending through said suction passage orifice in said valve plate means and through said suction valve chamber to said suction valve orifice in said valve plate means.

4,573,882

ELECTRICALLY OPERATED FUEL PUMP APPARATUS

Kiyohiko Watanabe, Chiryu; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Kariya; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 17, 1982, Ser. No. 378,724
Int. Cl.[4] F04B *35/04*; F04D *5/00*
U.S. Cl. 417—366 **3 Claims**

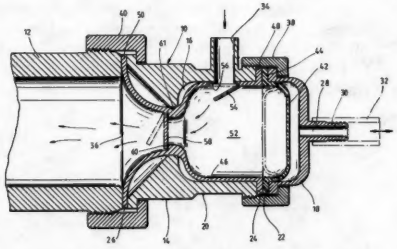


1. An electric motor and a fuel pump assembly comprising:
a regenerative pump including a first housing and an impeller rotatably mounted therein;
an electric motor including a second housing and a motor shaft;
a pair of bearings rotatably supporting said motor shaft on opposite end walls of said second housing, said motor shaft having an end portion extending outwardly beyond one of said end walls of said second housing;
said first housing being substantially aligned with said second housing and having one end wall fixed to said one end wall of said second housing;
a second shaft provided independently of said motor shaft and fixed only at one end to the other end wall of said fist housing to rotatably support said impeller thereon;
said impeller being not fixed to said second shaft axially thereof;
said impeller and said first housing being arranged such that the opposite sides of said impeller and the end walls of said first housing are disposed in substantially liquid-sealing but slidable relationship with each other;
said one end wall of said first housing being formed therein with a through-hole; and
joint means in said through-hole fixed to said end portion of said motor shaft and loosely but drivingly connected to said impeller for transmitting rotation of said motor shaft to said impeller, whereby ssaid regenerative pump and said electric motor can be assembled separately and then connected together into said assembly.

4,573,883
DISPOSABLE BLOOD PUMP

George P. Noon; Louis W. Feldman, both of Houston, and Julia A. Peterson, South Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Mar. 1, 1985, Ser. No. 707,255
Int. Cl.[4] F04B *43/06;* A61M *1/10*
U.S. Cl. 417—394 3 Claims



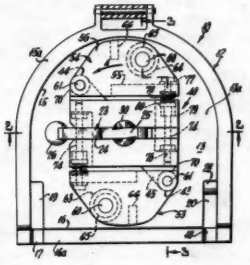
1. A disposable blood pump comprising,
a rigid housing having a cavity therein and having first and second parts, said first part having a first supporting shoulder and said second part having a second and third supporting shoulder,
said first part including a port for receiving actuating fluid,
said second part including a blood inlet port and a blood outlet port,
coupling means connected between the first and second parts for joining said two parts with the first and second shoulders adjacent each other,
coupling means connected to the second part for joining the second part to another blood handling device,
a flexible hemocompatible diaphragm positioned in the cavity, said diaphragm having an outer edge supported between the first and second supporting shoulders,
a flexible wall hemocompatible pumping chamber having first and second ends, and positioned in said cavity, said first end supported between the first and second supporting shoulders, said second end engaging said third shoulder,
said chamber having an integral inlet leaf valve and an integral outlet leaf valve, said inlet valve being in communication with the blood inlet port, and said outlet valve being in communication with the blood outlet port, said valves being operable between open and closed positions by alternately actuating the diaphragm.

4,573,884
PERISTALTIC PUMP

Vernon H. Troutner, St. Petersburg, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Division of Ser. No. 410,736, Aug. 23, 1982, Pat. No. 4,487,558.
This application Jul. 30, 1984, Ser. No. 636,040
Int. Cl.[4] F04B *9/14, 43/08*
U.S. Cl. 417—374 3 Claims

1. In a roller pump of the type comprising:
(a) a backing plate having an upper surface, a lower surface, and an opening therethrough,
(b) a bearing mounted in said opening,
(c) a shaft mounted in said bearing, said shaft having a first end portion and a second end portion, the first end portion of the shaft extending upwardly from the upper surface of the backing plate and having an opening which extends inwardly from the upper end of the shaft and which is defined by a pair of generally parallel, vertically extending side walls, the second end portion of the shaft extending downwardly from the lower surface of the backing plate and being adapted for coupling to a drive means,
(d) an arcuate backing wall on the upper surface of the backing plate,
(e) a pump head removably mounted on the upper portion of the shaft, said pump head comprising a hub portion and at least one roller means mounted for rotation about an axis which is parallel to the axis of said shaft,
(f) a handle means comprising an arm being pivotally mounted on said pump head and adapted to be engaged with said opening in said shaft to mechanically couple said pump head to said shaft,

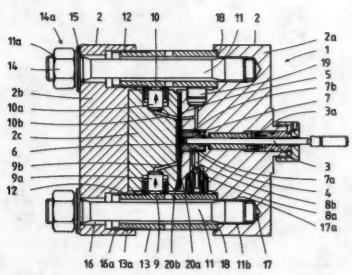


the improvement wherein said arm has a generally centrally located recessed portion, said shaft comprises at least one ledge on one side of said opening, and a wedge shaped portion has been cut away from the side wall diagonally across said opening from said ledge, whereby when said arm is engaged with said opening and the pump shaft is rotated, said ledge overrides said recessed portion, thus preventing said pump head from moving upwardly on the shaft.

4,573,885
PISTON DIAPHRAGM PUMP

Dirk Petersen, Norderstedt, Fed. Rep. of Germany, assignor to Bran & Lübbe GmbH, Norderstedt, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,624
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414006
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—383 5 Claims



1. In a piston diaphragm pump, comprising a housing having an inlet passage and an outlet passage; valves connected to said inlet and outlet passage, said housing having a feeding chamber connected to said inlet and outlet passage via said valves, said housing including housing portions releasably clamped to each other; at least one diaphragm sealingly clamped between said housing portions; a piston working chamber filled with a hydraulic medium in an operation position and separated from said feeding chamber by said diaphragm; a reciprocally displaceable piston in said working chamber and being operative

to cause stroke deflections of said diaphragm so as to change volumes of said feeding chamber; a plurality of clamping bolts each connected to one of said housing portions and extending parallel to a direction of clamping of the housing portions to each other, each of said bolts having a threaded portion; and a plurality of clamping elements each provided with a thread tightened on a respective threaded portion of each bolt to draw said housing portions to each other, the improvement comprising:

(a) at least one of said housing portions being provided with at least one supporting thread which extends parallel to said direction of clamping;

(b) at least one supporting member to be screwed to said supporting thread and projecting in an assembled position in the direction towards another of said housing portions by a distance corresponding to its screwed position; and

(c) said another housing portion having an abutment surface extended at right angles to said direction of clamping, said supporting member upon being screwed outwardly relative to said supporting thread abutting against said abutment surface.

4,573,886

VALVE ASSEMBLY FOR HIGH PRESSURE PUMP

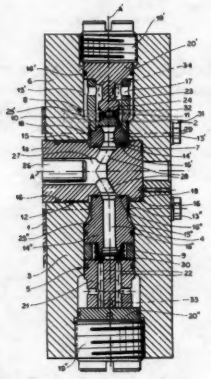
Wolfgang Maasberg, Hünxe-Krudenburg, and Adalbert Huperz, Hockenheim, both of Fed. Rep. of Germany, assignors to Woma-Apparatebau Wolfgang Massberg & Co. GmbH, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 193,669, Oct. 3, 1980, abandoned. This application Apr. 5, 1983, Ser. No. 481,441

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940606

Int. Cl.⁴ F04B *21/00*

U.S. Cl. 417—454 **12 Claims**



1. A valve assembly for a high-pressure pump, said assembly comprising:

a valve housing having a central bore centered on a main longitudinal axis and a transverse bore extending radially from said central bore in opposite directions along a transverse axis and subdivided by said central bore into an intake transverse-bore part and an exhaust transverse-bore part, the housing being of a material with a relatively low resistance to erosion;

respective intake and exhaust sleeves in said intake and exhaust bore parts;

respective intake and exhaust valves in said intake and exhaust sleeves;

a flow-splitting sleeve in said central bore and having a pair of lateral branches opening respectively in said intake and exhaust bore parts into said intake and exhaust sleeves, said sleeves being received in the respective bores with radial play relative to the respective axes and forming with the respective bores respective annular chambers that communicate with one another, one of said intake and exhaust sleeves being formed with a radial passage opening into the respective chamber, the sleeves all being of a material with a relatively high tensile strength and resistance to erosion; and

seal means including seals engaged between said sleeves and the respective bores for isolating said chambers from communication with said bores and the interiors of said sleeves except through said passage and for pressurization of said chambers by said pump through said passage, whereby there is substantially no flow in the annular chambers.

4,573,887

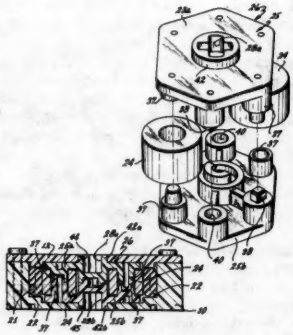
CORROSION-RESISTANT ROLLER-TYPE PUMP

Jo Dee. J. Smith, Tustin, Calif., assignor to S. E. Rykoff & Co., Los Angeles, Calif.

Filed Sep. 16, 1983, Ser. No. 532,671

Int. Cl.⁴ F04B *43/12, 45/08*

U.S. Cl. 417—477 **7 Claims**



1. A rotary pump for pumping measured amounts of corrosive fluids, comprising:

a housing containing a chamber having a curved inner wall;

a removable cover with an outer sursface for closing the chamber;

power-driven rotor means within said housing;

a soft resilient tube with two ends, disposed within the chamber along said inner wall, said tube being squeezed closed by said rotor means against said inner wall at spaced intervals so as to transport predetermined quantities of fluid along said tube as said rotor means turns;

relatively stiff, kink-resistent conduit means engaging the ends of said tube for conveying fluid into and out of said tube; and

clamping means forming a releasable fluid-type bond between the ends of said tube and said conduit means;

said rotor means containing opposed outer surfaces, each of which surfaces is provided with a like, outwardly extending annular boss with an outer surface; and said cover containing a circular opening for rotatably receiving one of said bosses when the cover is in closed relationship with

the housing, with the outer surface of the boss being in a generally planar relationship with the outer surface of the cover.

4,573,888

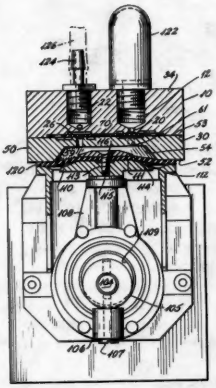
FLUID PUMP

Dwight W. Kitchin, Littleton, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.

Continuation of Ser. No. 530,838, Sep. 9, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,115

Int. Cl.[4] F04B *21/02*

U.S. Cl. 417—560 **5 Claims**



1. An improved fluid pump with a check valve cooperating with a reciprocating diaphragm comprising:

(a) an inlet upstream of the check valve;

(b) an outlet downstream of the check valve;

(c) a valve seat between said inlet and outlet;

(d) a resilient valve member movably mounted between said inlet and outlet and cooperating with said valve seat to allow flow above a predetermined pressure from said inlet to said outlet while preventing flow in a reverse direction;

(e) a first chamber disposed on one side of said resilient valve member and substantially surrounding said valve seat and a second chamber disposed on the other side of said resilient valve member and surrounding said outlet;

(f) the diameter of said first chamber being slightly greater than the diameter of said second chamber and the diameter of said second chamber being slightly greater than the diameter of said valve seat;

(g) said valve member being formed as a portion of a valve plate, said valve member including an isthmus connected to a main portion of said valve plate, and said isthmus is wedged between an outer peripheral portion of said first chamber and an outer peripheral portion of said second chamber; and

(h) said first chamber further includes a tongue-like extension extending outwardly from said outer peripheral portion thereof, said valve member includes a tongue-like extension which extends into said tongue-like extension of said first chamber in spaced relation to said main portion of said valve plate and said valve member tongue-like extension remaining in engagement with the outer peripheral portion of said second chamber at all times even when said main portion is moved relative to said valve seat.

4,573,889

BEARINGS FOR GEAR PUMPS

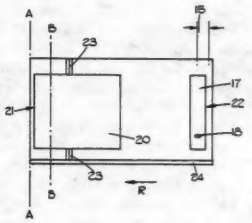
Jeffrey A. Lane, West Midlands, England, assignor to Lucas Industries, Ltd., Birmingham, England

Filed Nov. 7, 1983, Ser. No. 549,680

Claims priority, application United Kingdom, Nov. 10, 1982, 8232053

Int. Cl.[4] F04C *29/02*; F16C *32/06*

U.S. Cl. 418—73 **8 Claims**



1. A bearing bush for a pump in which rotation of externally meshed gears is accompanied by displacement of a liquid thereby, said bush having a substantially cylindrical bore, said pump including a second bush arranged in parallel with the first-mentioned bush, a first recess in said bore adjacent a critical zone thereof, said critical zone lying substantially in the first quadrant in the direction of rotation of a shaft in said first-mentioned bush, measured from a plane including the axes of the two bushes, a first passage connected to said first recess for supplying a liquid under pressure to said first recess, a second recess in said bore, said second recess lying wholly outside said critical zone and having an axial extent less than the axial extent of said first-mentioned bush, said second recess having ends thereof spaced axially inwards from the opposite ends of said bush, the circumferential extent of said second recess being not less than 130 degrees, said second recess thereby providing a liquid reservoir within said bore, and a second passage for supplying a liquid to said second recess said second passage having a circumferential extent substantially less than that of said second recess.

4,573,890

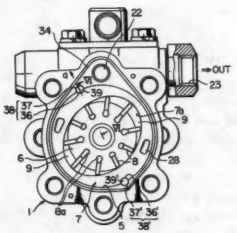
VANE PUMP WITH LOCATING PINS FOR CAM RING

Shigeyuki Hadama, Atsugi, and Kyoichi Sugizaki, Ebina, both of Japan, assignors to Atsugi Motor Parts Co., Ltd., Japan

Filed Oct. 22, 1984, Ser. No. 663,133

Int. Cl.[4] F04C *2/00, 15/00*; B23P *15/00*

U.S. Cl. 418—108 **4 Claims**



1. A vane pump having:

a housing;

a cam ring fixedly housed in an annular recessed portion of the housing;

a rotor rotatably supported within the cam ring; and

a plurality of vanes fitted to slots formed in the rotor in such a way as to be slidably movable in the radial direction of the rotor in contact with the elliptical inner circumferential surface of the cam ring, wherein the improvement which comprises:

(a) a pair of semicircular housing grooves formed on the inner circumferential surface of the annular recessed portion of the housing and in the axial direction of the housing, said two semicircular housing grooves being located diametrically opposed to the center of the recessed portion;

(b) a pair of semicircular cam ring grooves formed on the outer circumferential surface of the cam ring and in the axial direction of the housing, said two semicircular cam ring grooves being located diametrically opposed to the center of the cam ring in such a way as to provide two locating pin holes in cooperation with said two semicircular housing grooves, respectively; and

(c) a pair of locating pins pressure-fitted, respectively, to said locating pin holes formed by said two semicircular housing grooves and said two semicircular cam ring grooves in order to forcibly eliminate a developed eccentricity between the housing and the cam ring, one locating pin having an appropriate diameter greater than that of the locating pin holes being previously selected according to the eccentricity developed at positions where the two locating pin holes are formed, a diameter of the other locating pin being substantially equal to that of the other locating pin holes.

4,573,891

ROTARY SLEEVE OF A ROTARY COMPRESSOR

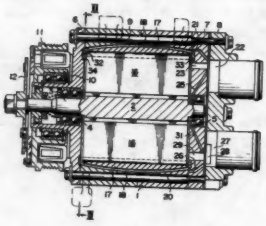
Hiroshi Sakamaki, Utsunomiya; Yukio Horikoshi, Kazo, and Kikuji Yanagihashi, Yono, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,214

Claims priority, application Japan, May 20, 1983, 58-087619

Int. Cl.⁴ F04C *18/344*

U.S. Cl. 418—173 **6 Claims**



1. A rotary compressor comprising:

a central housing with an internal cavity;

a rotary sleeve rotatably floating, suspended within said central housing by means of a pneumatic bearing chamber, the radial distance between the rotary sleeve and the central housing being wider at both end portions of the rotary sleeve;

a rotor rotatably housed in said rotary sleeve and a vane free to move into and out of said rotor;

a barrel formed on the outside surface of said rotary sleeve, the radius of said barrel gradually diminishing from the axial center toward both ends; and

a barrel formed on the inside surface of said central housing, said barrel on the inside surface of said central housing spacedly following said barrel formed on the outside surface of said rotary sleeve at least over one part of the length of said rotary sleeve.

4,573,892

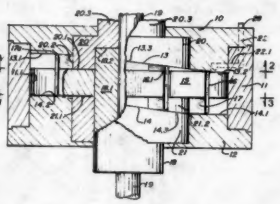
ROTARY FLUID DEVICE WITH AXIALLY SLIDING VANES

Clement O. DuFrene, Cottage Grove, Minn., assignor to Gordon Rosenmeier, Little Falls, Minn., a part interest

Continuation of Ser. No. 677,553, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 526,340, Aug. 25, 1983, Pat. No. 4,534,436. This application Jun. 20, 1985, Ser. No. 746,467

Int. Cl.⁴ F01C *1/00*

U.S. Cl. 418—219 **3 Claims**



1. A rotary fluid motor or pump device comprising

a housing including an outer cylindrical member and opposing plate members which form walls defining a circular interior cavity with opposing contoured annular cam surfaces equi-distantly spaced from each other at all points of equal radii from the center of said cavity, said opposing cam surfaces being on said opposing plate members, each said opposing plate member having an annular bushing fixed thereto at a central location thereof,

a shaft extending from the exterior of said housing through at least one said bushing into said cavity,

a rotor concentrically mounted on said shaft at a location within said cavity between said bushings and said opposing cam surfaces and dividing said cavity into two opposing chambers with said rotor therebetween, said bushings providing bushing surfaces against which a radially inward lateral surface of said rotor is adapted to rotate, said rotor consisting of a single element having at least eight radial slots equally spaced circumferentially about the peripheral portion thereof,

a slidable vane member in each said slot of said rotor, each said vane member extending as a wall between said opposing contoured annular cam surfaces, said bushings forming at their outer annular surfaces an inner race for said vane members, said outer race for said vane members being formed by the inner surface of said outer cylindrical member of said housing, and

two separated fluid passage systems through the walls of said housing, each said system having a single port in communication with each said chamber,

said device being particularly characterized by the fact that

each said opposing cam surface has a valley portion spaced from the rotor and a diametrically opposed hill portion nearest the rotor, with diametrically opposed uniformly graduated slopes between said valley and hill portions, each said slope extending over a circumferential arc of at least about 130°,

never less than two said slidable vane members are at a location along each said slope of each said cam surface, regardless of the rotational orientation of said rotor,

a circumferential arc no greater than about 50° separates said single port of one fluid passage system from said single port of the other fluid passage system in communication with a said chamber, with each said single port of communication being adjacent to end of a cam surface slope located nearest said rotor and opening on said slope, each said porting including a channel consisting of a groove on the cam surface slope for chamber communication over an

arc substantially equal to the arc of the cam surface slope with which the port is associated, and

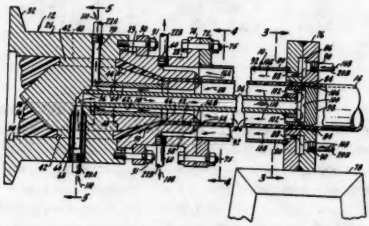
at least six chamber spaces between vane members of said device are always functioning to receive fluid and at least six such chamber spaces are always functioning to exit fluid at all times during rotation of said rotor.

4,573,893

EXTRUSION DIE WITH EXTERNAL AND INTERNAL COOLING MEANS

Michael A. Waters, Elk Grove Village, and Daniel P. Boll, Mt. Prospect, both of Ill., assignors to Application Engineering Corporation, Wood Dale, Ill.

Filed Apr. 2, 1984, Ser. No. 596,032
Int. Cl.[4] B29D *7/02*; B29F *3/08*
U.S. Cl. 425—71 **18 Claims**



1. Cooling apparatus for an extruder of the kind in which hot molten resin is forced through an extruding die to form an elongated extrusion of given cross-sectional shape, employing a liquid coolant, comprising:

a cylindrical shell having its inner end surrounding the outlet of the extruding die and projecting outwardly therefrom in encompassing relation to a predetermined length of the extrusion emerging from the die;

a shell seal ring extending radially inwardly of the outer end of the shell and having an axial outlet opening with a shape conforming to the external cross-sectional shape of the extrusion;

the shell, the seal ring, and the external surface of the extrusion affording an annular, sealed cooling chamber encompassing a predetermined length of the extrusion emerging from the die;

an annular cooling chamber extension formed in the extruding die, in fluid communication with the cooling chamber so as to effectively extend the cooling chamber into the die;

at least one inlet port connected to the outer end of the cooling chamber;

at least one outlet port connected to the cooling chamber extension;

and means, connected to the inlet and outlet ports, for filling the cooling chamber with a liquid coolant and for circulating the liquid coolant through the cooling chamber from its outer end to its inner end and out through the chamber extension to cool the external surface of the extrusion and solidify the extrusion as it emerges from the extruder

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4,573,894

APPARATUS FOR VENTLESS TIRE MOLDING

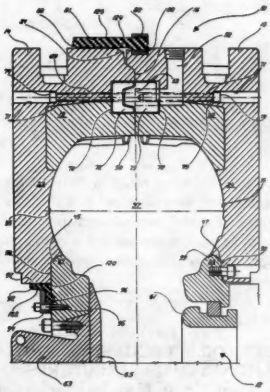
Jerome J. Blayne, Brecksville; James Sidles, Richfield, and Donald R. Bartley, Cuyahoga Falls, all of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,397
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—36 **8 Claims**

1. In a tire mold having tread, sidewall and bead components defining a mold cavity, the mold being radially divided by a circumferential parting line intersecting with an external surface of the mold, at least some mold components being moveable to open and close the mold along the parting line, the improvement comprising:

an inner mold surface defined by the bead, tread and sidewall components essentially free of venting outlets by which a fluid may pass from within the mold cavity to without;

at least one conduit means having a point of communication positioned at the parting line radially outwardly of the tread components and a vaccum source, the conduit means being configured for interruptable interconnection with the vacuum source and the conduit means and vacuum source being of a size sufficient whereby the mold, upon being sealed, may be evacuated to not more than 16932 Pa within not more than 60 seconds of vacuum application;



a seal disposed to enclose annularly in a sealing relationship the parting line, positioned radially outwardly of the conduit means point of communication, the seal being of a nature wherein one seal surface is exposed to pressure within the mold cavity and an obverse seal surface is exposed to a pressure sourced outside the mold cavity, and whereby upon evacuation of the mold cavity, by inherent seal configuration, the seal is urged into a more tightly sealing relationship, the seal being configured to sealingly engage outer surfaces of the mold as separated by the parting line beginning in a range of mold openings along the parting line of between 0.10 and not more than 5.08 centimeters to substantially preclude the movement of air into the mold cavity, and the seal being configured to be capable of continuing to preclude such air movement during and after mold closure.

4,573,895

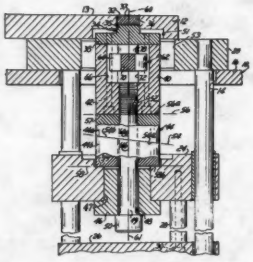
ADJUSTABLE DIE AND PUNCH ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Troy, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX-Pentronix, Inc., Lincoln Park, Mich.

Division of Ser. No. 419,827, Sep. 20, 1982, Pat. No. 4,450,127, which is a continuation-in-part of Ser. No. 351,482, Feb. 23, 1982, Pat. No. 4,390,335. This application Feb. 21, 1984, Ser. No. 581,979
Int. Cl.[4] B30B *11/02*
U.S. Cl. 425—78 **6 Claims**

1. A punch and die assembly for powder compacting press, said assembly comprising a die plate having an upper surface, at least one bore through said die plate, a punch having an end slidably disposed in said bore in said die plate, said punch having an end face normally substantially parallel to said die plate under surface, a punch base member, a reciprocal platen supporting said punch base member, means for reciprocating

said platen, and means disposed between said punch base member and said platen for adjustably inclining said punch for disposing said punch face non-parallel to said die plate upper surface, wherein said means for adjustably inclining said punch comprises an adjusting member disposed between said platen and said punch base member, said adjusting member having



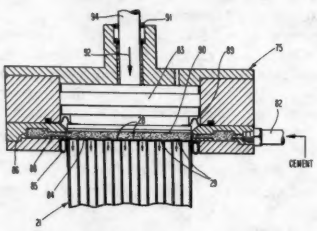
parallel end faces and being made in two portions having a common surface of junction disposed in a plane at an angle to said parallel end faces, said two portions being independently rotatable relative to each other around a common axis at said surface of junction for inclining one of said end faces realtive to the other.

4,573,896

APPARATUS FOR SELECTIVELY MANIFOLDING HONEYCOMB STRUCTURES

Roy T. Bonzo, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 283,732, Jul. 15, 1981. This application Apr. 21, 1983, Ser. No. 487,446
Int. Cl.[4] B29C *27/14*
U.S. Cl. 425—125 **4 Claims**



1. A press apparatus for charging a flowable material into a honeycomb structure having a plurality of cells open at an end face thereof comprising:

a press head having a chamber with an opening at an outer surface of the press head to accept said honeycomb structure for charging and further having a bore extending away from said chamber opposite said opening;

means for securing said end face of said honeycomb structure across said opening, said means for securing comprising a pneumatically inflatable collar affixed to said press head;

means for injecting said flowable material through said press head into said chamber;

piston means slidably mounted in said bore for pressing said flowable material in said chamber into the end face of said structure; and

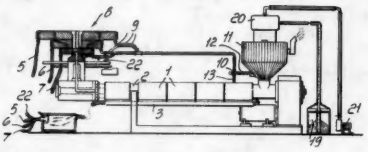
a flexible annular diaphram affixed at its outer edges to said press head and at its center to said piston means.

4,573,897

SYSTEM FOR HOT EXTRUDING, DRAWING, AND SIMILARLY PROCESSING PLASTOMERS OR ELASTOMERS, INCORPORATING A MEANS OF RECOVERING AND UTILIZING HEATED AIR FROM THE COOLING OF HEATED PARTS

Gaetano Piazzola, Via Borri, 148, 21100 Varese, Italy

Filed Mar. 12, 1984, Ser. No. 588,653
Claims priority, application Italy, Mar. 17, 1983, 20132 A/83
Int. Cl.[4] B29B *13/02*
U.S. Cl. 425—143 **1 Claim**



1. In a system for extruding, molding, drawing and similarly hot processing plastomers or elastomers, utilizing for cylinder heating ventilated electric thermal units mounted on said cylinder, the improvement therein said system is a closed loop type of system comprising a plurality of pipes adapted to deliver hot air from said electric thermal units to areas of said system requiring heat application and to return at least a part of said air to said electric thermal units and wherein said electric thermal units are adapted and constructed to admit hot air into a channel communicating with an insulated hot air storage chamber therefrom a plurality of thermally insulated duct lines extend coupled to specially provided grooves arranged peripherally to the various parts of the blow-working head, or molds, or dies, or flat heads, said hot air being then exhausted through additional duct lines and a three way valve into a drier or dehumidifier acting as a granule feeder, a part of said air being returned to said thermal units to decrease the thermal work of the latter, thereby improving thermal efficiency, said cylinder temperature and pressure working conditions and the life of said thermal units.

4,573,898

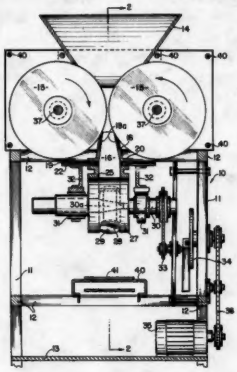
POSITIVE PRESSURE DOUGH DIVIDER

Donald A. Jones, Mornington; Gerhard F. Wawra, Vermont South, and William R. Moss, Wantirna, all of Australia, assignors to Baker Perkins, Pty., Ltd., Victoria, Australia

PCT No. PCT/AU83/00133, § 371 Date Aug. 3, 1984, § 102(e) Date Aug. 3, 1984, PCT Pub. No. WO84/02633, PCT Pub. Date Jul. 19, 1984
PCT Filed Sep. 27, 1983, Ser. No. 638,482
Claims priority, application Australia, Jan. 4, 1983, PF7487
Int. Cl.[4] A21C *5/04*
U.S. Cl. 425—145 **9 Claims**

1. A positive pressure dough divider comprising a dough supply, a pair of rotatable sheeting rolls for creating positive pressure in the dough while carrying the dough from said supply into a transfer passage leading to one or more volumetric measuring chambers, wherein said rolls provide a positive pressure rise along the direction of flow in the transfer passage between the rolls sufficient to charge the measuring chamber or chambers with dough under pressure, and barriers extending between the rolls and adjacent to ends of the rolls for preventing leakage of dough at the ends, the barriers being

formed to diverge outwardly toward the ends and with respect to the direction of dough flow between the rolls and to follow



the circumferential surfaces of the rolls with a safe running clearance from the rolls.

4,573,899

PLANT FOR THE MANUFACTURE OF PARTICLEBOARD

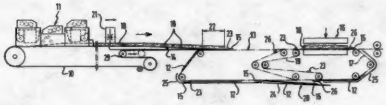
Dieter Wiemann, Barsinghausen, and Günther Bodusch, Springe, both of Fed. Rep. of Germany, assignors to Bison-Werke Bahre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,373

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247551

Int. Cl.⁴ B29C *43/02, 43/34, 45/77*

U.S. Cl. 425—145 **15 Claims**



1. A plant for the manufacture of particle board comprising:

a stationary scattering station for forming a mat of particulate material;

an endless forming band onto which said mat-forming material is scattered, said forming band being mounted on stationary supporting means;

means for continuously moving said forming band beneath said scattering station at a constant speed;

a movable mat cutting saw disposed above said mat for dividing said mat into individual mat sections;

a plurality of mat carriers each having first and second sides and a head strip;

an intermediate endless conveyor disposed after said forming band for moving said mat carriers beneath mat sections supplied from said forming band, whereby each mat section is transferred onto a respective mat carrier;

a vertically and horizontally moveable transfer table disposed between said scattering station and said intermediate conveyor, said transfer table having an end which overlaps said intermediate conveyor and said endless forming band, moving from said scattering station over said transfer table and being deflected around said end of said transfer table;

means for advancing and retracting said transfer table relative to said intermediate conveyor to vary said overlap, whereby said transfer table is in an advanced position at the start of transfer of a mat section from the forming band to a respective one of said mat carriers and in a retracted position at the completion of said transfer;

a cyclically operating press disposed after said intermediate conveyor and having an inlet and an outlet;

loading and unloading means for said press, with said forming band, said intermediate conveyor and said loading and unloading means corresponding to move said mat section in a transport plane;

means for separating pressed mat sections from said mat carriers at said outlet of said press;

means disposed beneath said transport plane for returning mat carriers separated from said pressed mat sections to said intermediate conveyor; wherein said intermediate conveyor simultaneously serves to supply said mat carriers to said loading means and has transport means for engaging said head strips at said first and second sides; wherein said loading and unloading means means includes further transport means for engaging said head strips at said first and second sides; wherein said further transport means move during part of their movement in said transport plane parallel to and alongside the first said transport means; wherein said means for returning mat carriers separated from said pressed mat sections includes a transfer station disposed between said loading and unloading means and said intermediate conveyor; and wherein said intermediate conveyor is constructed as an accelerating conveyor, there being means for driving said intermediate conveyor at said constant speed of said forming band during transfer of a said mat section onto a said mat carrier and for accelerating said intermediate conveyor when the said mat section is fully transferred to said mat carrier.

4,573,900

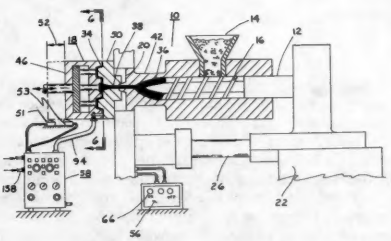
EVACUATION SYSTEM FOR INJECTION MOLDING MACHINES

Lyle Smith, Danbury, Conn., assignor to Alpha Molding Technologies Associates, Danbury, Conn.

Filed Dec. 6, 1984, Ser. No. 679,053

Int. Cl.⁴ B29F *1/00*

U.S. Cl. 425—157 **8 Claims**



1. An apparatus for controlling operating pressure during predetermined increments of time in a mold cycle for producing intricate and thin wall plastic parts formed within a cyclical injection molding die operatively associated with an injection molding machine, said apparatus comprising:

A. a mold cavity located between a mating male and female die member of said cyclical injection molding die, said mold cavity having an inlet port for receiving a heated thermoplastic material,

B. a sealing device for insuring an airtight bond between said mating male and female die member during said mold cycle when said cyclical injection molding die is closed,

C. a venting path for operatively applying a sustained negative pressure to said mold cavity during a first time interval beginning after said cyclical injection molding die has

closed and before said cyclical injection molding die has filled with said heated thermoplastic material,

D. first control means for maintaining a substantially constant negative pressure within said mold cavity during said first time interval of said mold cycle while said intricate, and thin walled parts are being formed,

E. second control means for reversing said substantially constant negative air pressure to a positive air pressure and for maintaining said positive air pressure at a level sufficiently high enough during a second time interval of said mold cycle to cause a predetermined incremental and uniform separation of said intricate and thin walled plastic parts from said male and female die member at a predetermined increment of time substantially close to that portion of time in said mold cycle when said cyclical injection molding die initially opens, and

F. means for resetting said first and second control means to an initial condition whereupon a succeeding mold cycle will be started.

4,573,901

DIE CARRIER MEMBER FOR DIE CLOSING UNIT OF INJECTION MOLDING MACHINE

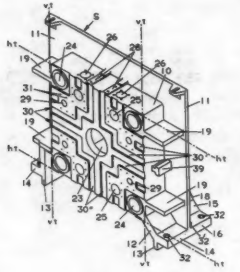
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,757

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402404; Jan. 25, 1984, 3402405

Int. Cl.[4] B29F *1/06*

U.S. Cl. 425—451 **14 Claims**



1. A die closing unit for an injection molding machine comprising a stationary die carrier member and a movable die carrier member, hydraulic actuator means driving the movable die carrier member to execute die opening and closing movements in relation to a stationary die carrier member along a longitudinal center axis of the die closing unit and producing an elevated die closing pressure, and four parallel tie rods engaged in aligned tie rod bores of the two die carrier members, the tie rods guiding the movable die carrier member in said movements, the two die carrier members having oppositely facing parallel die mounting faces to which the stationary and movable die halves of an injection molding die are attachable, said die mounting faces extending perpendicularly to said center axis and having substantially identical rectangular outlines, in the four corner areas of which are located the tie rod bores; the improvement therein, having for its purpose to enhance the dimensional stability and rigidity of the die closing unit, being characterized in that:

at least one of the two die carrier members is in the form of a rectangular plate of cast iron having two parallel opposite plate faces, one of which is machined to serve as the die mounting face of the die carrier member;

the cast iron is of a type which forms a casting skin the tensile strength of which is considerably greater than the strength of the cast iron below said skin;

the machined die mounting face includes substantially continuous narrow machined surface portions surrounding the four tie rod bores,

the remainder of the surface area of the rectangular plate defines a pattern of shallow face grooves the bottom surface of which is parallel to the mounting face and not machined, so as to retain its casting skin; and

the face grooves in said pattern are oriented parallel to the sides of the rectangle and spaced apart, so as to alternate with band-like machined surface portions of substantially the same width as the face grooves, the casting skin in the face grooves thereby serving to stabilize and stiffen the carrier member.

4,573,902

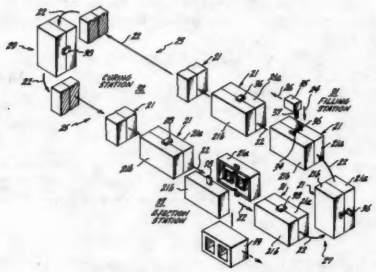
MACHINE FOR MANUFACTURING FOAM BUILDING BLOCKS

Nikolaus J. Heilman, Kent; David A. Wix, Seattle, and Gary M. Egerer, Auburn, all of Wash., assignors to Interblock Partners, Ltd., Kent, Wash.

Filed Jun. 24, 1983, Ser. No. 507,548

Int. Cl.[4] B29C *45/04, 45/42, 45/64*

U.S. Cl. 425—543 **14 Claims**



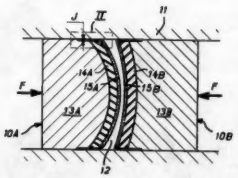
1. A machine for forming molded items, the machine having a plurality of forming molds, each forming mold including pieces movable with respect to one another such that the forming mold can be changed between a closed configuration in which the pieces form a mold cavity having a hole for injection of raw materials and a separated configuration in which a molded item can be removed from the forming mold, the machine further having conveyor means for supporting and moving the forming molds along a path-of-travel through filling and ejection stations, filling means located at the filling station for injecting raw materials through the holes into the forming molds, and ejection means located at the ejection station for removing molded items from the forming molds, characterized in that the forming molds move through the filling station in the closed configuration and the filling means includes a gun having a nozzle, a positioning mechanism for lowering the nozzle into the holes in the forming molds as the forming molds enter the filling station and for moving the gun with the movement of the forming molds as the forming molds move through the filling station, and means for injecting the raw materials into the closed forming molds through the nozzle as the forming molds move through the filling station.

4,573,903

OPTICAL COMPONENT MOLDING APPARATUS FOR FOLLOWING THE DIFFERENTIAL SHRINKAGE OF MOLDED SYNTHETIC MATERIAL

Jean Boudet, Bressey sur Tille, and Guy Rolland, Vincennes, both of France, assignors to Essilor International Cie Generale d'Optique, Paris, France

Filed Jul. 15, 1983, Ser. No. 513,998
Claims priority, application France, Jul. 16, 1982, 82 12479
Int. Cl.[4] B29D *11/00*
U.S. Cl. 425—555 20 Claims



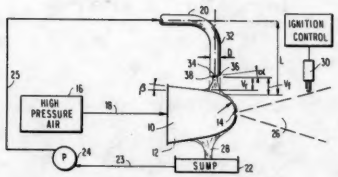
1. A device suitable for molding synthetic molding material into optical components, said device comprising two spaced mold parts disposed in face-to-face relationship and defining a mold cavity for an optical component; at least one of said mold parts including a rigid supporting base, a molding die elastically deformable in the course of molding a component, and an intermediate pad of an incompressible elastic material disposed between said base and said molding die and completely covering the respective surfaces thereof; said pad being of a thickness and elasticity to form means for effecting movement of said molding die to follow differential shrinkage of molded synthetic material in the course of setting of said molded synthetic material.

4,573,904

LIQUID DELIVERY APPARATUS AND METHOD FOR LIQUID FUEL BURNERS AND LIQUID ATOMIZERS

Robert S. Babington, 1113 Ingelside Ave., McLean, Va. 22101, assignor to Robert S. Babington, McLean, Va.

Filed Mar. 17, 1983, Ser. No. 476,453
Int. Cl.[4] F23D *5/12*
U.S. Cl. 431—117 19 Claims



1. In an atomizing means of the type including a plenum having an exterior wall with a small aperture therethrough through which pressurized air delivered from pressurized source means is caused to issue, the exterior surface of said wall being smooth and convex, the improvement comprising:

a tube through which liquid fuel from a fuel supply means is to be flowed over said exterior surface and across said aperture, said tube having a downwardly directed, substantially straight portion at its exit end with a center line, said straight portion terminating above said plenum with a discharge opening having its front edge closer to said aperture than its rear edge, the distance from said front edge to said convex portion being from 1.5 to 2.0 times the distance from said rear edge to said convex portion both distances being measured parallel to said centerline,

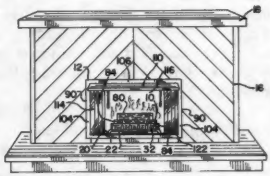
whereby when fuel flows through said tube at low flow rates suitable for low atomization rates, said tube causes the fuel stream between said discharge opening and said exterior surface to take on a bulbous shape which minimizes the film thickness at said aperture; and when fuel flows through said tube at higher flow rates suitable for high atomization rates, said tube causes the fuel stream between said discharge opening and said exterior surface to direct itself toward said aperture to thereby increase the film thickness at said aperture and means for igniting said atomized liquid fuel.

4,573,905

BURNER UNIT FOR FIREPLACE SIMULATION

Wayne E. Meyers, 401 N. Glen, West Chicago, Ill. 60185

Filed Nov. 13, 1984, Ser. No. 670,264
Int. Cl.[4] F23Q *2/32*
U.S. Cl. 431—125 7 Claims



1. A burner unit particularly adapted for use in a nonvented enclosure, said unit comprising:

a base with enclosed light source,

a base plate connecting with and positioned over said base with said plate formed with a cutout having an irregular front edge,

glass means positioned in said cutout to provide upward illumination from said light source and to produce in part a visual glowing ember effect,

grate means attached to said base plate above said cutout,

a fuel cell having a container portion connecting with said grate means and a lid portion having slides operatively connecting with guides attached to sides of said container portion to allow or preclude access to said fuel cell container portion, and

vent means formed in said fuel cell container portion and said lid to allow air circulation about fuel canisters disposable in said fuel cell container portion,

wherein during use of said burner unit fuel in said canisters may burn to produce heat with a temperature of said fuel, said fuel canisters and said fuel cell regulated by said air circulation, and light from said light source passing through said glass means to reflect from rock pieces disposable on said glass means may visually simulate glowing embers under said grate means, and during non-use of said burner unit said fuel cell lid may be positioned to enclose said container portion and limit said circulation of air sufficiently to inhibit combustion therein while allowing air circulation sufficient to vent said fuel cell as required.

4,573,906

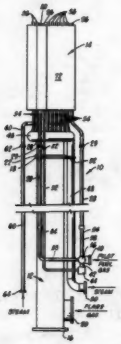
SHIELDED SMOKE SUPPRESSING FLARE GAS BURNER

Robert E. Schwartz; Roger K. Noble, and Michael R. Keller, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 645,420, Aug. 29, 1984. This application Feb. 21, 1985, Ser. No. 704,048

Int. Cl.[4] F23D *13/20*

U.S. Cl. 431—202 13 Claims



1. A flame impingement and heat shielded smoke suppressing flare gas burner comprising:

a tubular member having a flare gas discharge end and an inlet end adapted for connection to a source of flare gas;

a smoke suppressant manifold adapted for connection to a source of smoke suppressant positioned exteriorly of said tubular member;

a plurality of smoke suppressant conduits connected to said manifold and extending exteriorly of said tubular member adjacent the discharge end portion thereof for discharging smoke suppressant;

pilot flame burner means for igniting flare gas discharged from said tubular member positioned adjacent the discharge end thereof;

pilot fuel conduit means for supplying fuel to said pilot flame burner means connected to said burner means and extending exteriorly of said tubular member to the inlet end thereof; and

an external protective covering formed of refractory material attached over said plurality of smoke suppressant conduits, over said pilot fuel conduit means and over the exterior wall surface of said tubular member at the discharge end portion thereof whereby said exterior wall surface, said smoke suppressant conduits and said pilot fuel conduit means are shielded by said protective covering and an aerodynamically improved external discharge end portion is provided on said tubular member.

4,573,907

LOW OXYGEN AND LOW PRESSURE DROP BURNER

William P. Coppin, and Tadeusz Karabin, both of Muncie, Ind., assignors to Maxon Corporation, Muncie, Ind.

Filed Nov. 7, 1984, Ser. No. 669,019

Int. Cl.[4] F23D *15/00*

U.S. Cl. 431—351 19 Claims

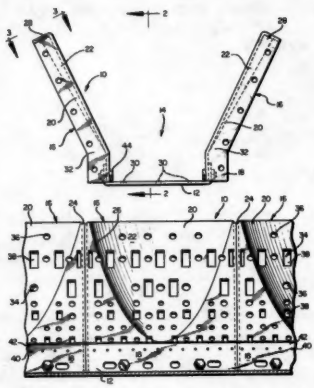
1. An improved burner unit for disposition in longitudinally connected array to form a burner trough, such burner for use in relatively lower oxygen and/or lower pressure drop air streams, and having improved thermal expansion performance, said burner unit comprising:

a burner base disposed at the bottom of the burner trough;

a pair of mixing plates having aeration openings therein, said mixing plates disposed on opposite lateral sides of said burner base, said mixing plates having

i. a lower flange disposed at the bottom of said mixing plate for attachment thereof to said burner base,

ii. a mixing plate body extending upwardly from said lower flange to form the sides of such burner trough, said mixing plate sides comprising a bulge therein which



protrudes outwardly with respect to the burner trough said bulge containing at least a portion of said aeration openings, and

iii. side flanges disposed on and extending from the sides of said mixing plate for engagement with and securement in series to a corresponding side flange of a further mixing plate to form the burner.

4,573,908

METHOD AND APPARATUS FOR PRODUCING WHITE CEMENT CLINKER

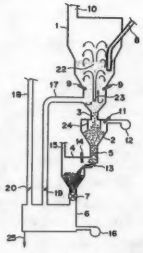
Toshikazu Ichiyanagi, Kumagaya; Kanzaburo Sudo, Saitama; Zenzaburo Kawai, Kumagaya; Shoji Sekine, Niza, and Hiroshi Teshigawara, Koshigaya, all of Japan, assignors to Chichibu Cement Kabushiki Kaisha and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,498

Claims priority, application Japan, Jun. 11, 1984, 59-118345

Int. Cl.[4] F27B *15/00;* F27D *15/02*

U.S. Cl. 432—58 3 Claims



1. An apparatus for producing white cement clinker comprising a fluidized bed burning furnace for burning white cement raw material particles into clinker particles, a reduction chamber below said burning furnace for reducing the clinker particles from said burning furnace, a jet injection pipe intercommunicating between a top of said reduction chamber and a

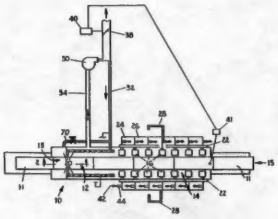
bottom of said burning furnace a primary cooling chamber communicated with said reduction chamber for cooling the clinker particles from said reduction chamber by spraying water and a secondary cooling chamber communicated with said primary cooling chamber, through means for feeding a predetermined quantity of clinker particles, for further cooling the cooled clinker particles from said primary cooling chamber with the air.

4,573,909

BILLET HEATING FURNACE WITH ADJUSTABLE PRESSURIZED ENTRANCE SEAL

Robert M. Scanlon, Rockford, Mich., assignor to Granco-Clark, Inc., Belding, Mich.

Filed Aug. 3, 1984, Ser. No. 637,436
Int. Cl.[4] F27B *3/04*
U.S. Cl. 432—133 **4 Claims**



1. In a furnace for heating articles to an elevated temperature wherein the articles are moved serially from an entrance end of the furnace to an exit end thereof comprising:

a preheater section at an entrance end of the furnace and a heating chamber at an exit end thereof;

means in said heating chamber for directing combustible gases against the articles therein;

means for providing turbulent gas flow along the length of said preheater section;

exhaust means including a fan communicating with said preheater section for drawing the exhaust gases of said combustible gases from the furnace;

said exhaust means drawing said exhaust gases from said heating chamber to said preheater section;

means for pressurizing said exhaust gases;

means for communicating said pressurized exhaust gases with said means providing turbulent gas flow;

means in said preheater section defining first and second chambers therein, said first chamber extending from the entrance end of the furnace along a portion of the length of said preheater section and said second chamber extending from said first chamber to said heating chamber; and

means for maintaining said first chamber at a first pressure at about atmospheric pressure and above the pressure of said second chamber with said pressurized exhaust gases, the improvement which comprises:

means external to said preheater section for adjusting said pressure in said first chamber independent of the pressure in said second chamber;

said means for maintaining the pressure in said first chamber at a first pressure comprises a conduit between said fan outlet and said first chamber, and said means for adjusting said pressure in said first chamber includes an adjustable valve in said conduit;

said means defining said first and second chambers includes a first baffle adjacent the entrance end of said furnace and a second baffle spaced inwardly from said first baffle; and

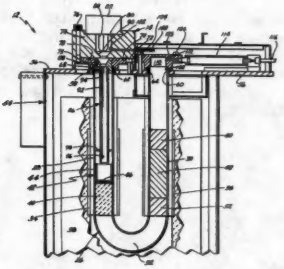
said first and second baffles include openings which closely conform to the configuration of articles which are heated in said furnace whereby said openings and said articles define a gap sealing arrangement.

4,573,910

CARBON, HYDROGEN, AND NITROGEN ANALYZER

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Division of Ser. No. 355,214, Mar. 5, 1982, Pat. No. 4,525,328.
This application Feb. 8, 1985, Ser. No. 699,574
Int. Cl.[4] F27B *14/00*; G01N *31/12*
U.S. Cl. 432—156 **13 Claims**



1. A combustion furnace for the combustion of a sample into constituent gases comprising:

an analytical furnace;

crucible-support means for supporting a crucible within said furnace;

sample-release means for dropping the sample to be analyzed into the crucible;

guide means for guiding the sample dropped from said sample-release means into the crucible; and

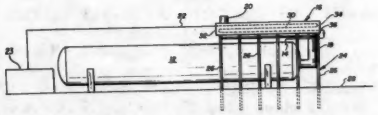
means adapted to be connected to a source of pressurized oxygen for directing oxygen downwardly through said guide means onto the sample in the crucible to facilitate combustion of the sample.

4,573,911

HEATER TREATER ECONOMIZER SYSTEM

Karl C. Kimmich, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,549
Int. Cl.[4] F27D *17/00*; F28D *7/00*; E21B *36/00*; F27B *14/00*
U.S. Cl. 432—179 **2 Claims**



1. In combination:

a heater treater for preshipment processing of heavy oil having an inlet for receiving an oil/water emulsion and a combustion heater for heating said oil/water emulsion and an outlet for supplying processed heavy oil for shipment;

a freewater knockout tank having an inlet for receiving an oil/water slurry and an outlet for providing an oil/water emulsion; and

a preheater placed between said outlet of said freewater knockout tank and said inlet of said heater treater, said preheater having a housing with an opening for receiving exhaust gas from said combustion heater of said heater treater, a plurality of conduit sections running the length of said housing arranged in horizontal rows, said conduit sections connected at opposite ends to provide a continuous conduit extending from outlet of said freewater knockout tank to said inlet of said heater treater and having heat conductive fins for heat transfer between said

exhaust gas and said conduit sections, said housing having vertical baffles for directing said exhaust gas alternatively up and down in a serpentine manner and horizontal baffles for sealing openings between said horizontal rows on a side of said housing, said housing having an insulating cover to prevent heat loss to outside ambience.

4,573,912

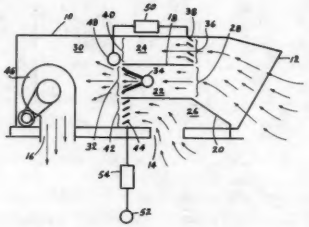
SPACE HEATER

Charles W. Albritton, Hermitage; William N. Powis, Sharpsville, both of Pa., and William M. Graham, Poland, Ohio, assignors to ITT Corporation, New York, N.Y.

Filed Jun. 26, 1984, Ser. No. 624,648

Int. Cl.⁴ F24H *1/00, 3/02;* **G05D** *23/00*

U.S. Cl. 432—222 **13 Claims**



1. A space heater comprising a housing having a discharge opening thereon, an outside air inlet opening and an inside air inlet opening, blower means for causing air to flow through said housing from said air inlet openings to said discharge opening, direct air burner means located upstream of said discharge opening and downstream of said outside air inlet opening, first adjustable damper means for bypassing some of the air from said outside air inlet opening around said burner or for directing more of this air across said burner, second adjustable damper means for varying the flow of inside air from said inside air inlet opening to said discharge opening, first control means operating said first adjustable damper means to maintain a constant flow of air across said burner, second control means operating said second adjustable damper means to control the flow of inside air.

4,573,913

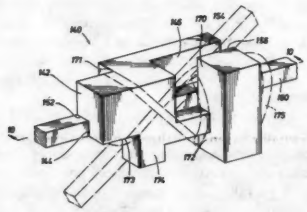
LINGUAL ORTHODONTIC APPLIANCE SYSTEM FOR EDGEWISE THERAPY

Thomas D. Creekmore, 1620 Fountainview, Houston, Tex. 77057

Division of Ser. No. 369,932, Apr. 19, 1982, Pat. No. 4,529,382. This application Sep. 17, 1984, Ser. No. 651,477

Int. Cl.⁴ A61C *7/00*

U.S. Cl. 433—17 **11 Claims**



1. A lingual orthodontic appliance for edgewise orthodontic therapy, comprising:

a pair of lingual molar tube brackets adapted for attachment to the lingual surfaces of opposed molars of each of a patient's oral arch forms, each of said molar tube brackets defining mesio-occlusally oriented slot means and mesio-distally oriented slot means in intersecting relation permitting mesio-occlusal insertion of respective archwire extremities therein and permitting pivotal rotation of the mesio-occlusally inserted archwire extremities relative to said molar tube brackets to permit insertion of the archwire toward the gingival into the occlusally oriented archwire slots of respective lingual brackets and into seated relation within said mesio-distally oriented slot means.

4,573,914

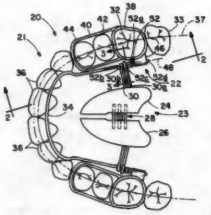
FORMATIVE ORTHODONTIC APPLIANCE

Philip J. Nord, 5213 SE. 30th #210A, Portland, Oreg. 97202

Filed Jan. 28, 1985, Ser. No. 695,706

Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—18 **5 Claims**



1. In a formative orthodontic appliance having counteracting pressure-applying first and second members, the first member including band means fixedly joinable to a tooth, a mechanism for adjustably biasing the first and second members comprising:

a body, fixedly adjoined to the band means, wherein a machine-screw-threaded bore extends into said body;

an arm having a first end fixedly adjoined to the second member and a second end having a loop positioned adjacent said body; and

adjustable joining means having a screw portion inserted into said bore, matingly threaded to said bore, for adjustment with respect to said body along a longitudinal axis of rotation, and a spool-like section which rotatably retains said loop.

4,573,915

OCCLUSIO-REFERENTIAL ARTICULATOR

Eugen Merz, Alte Landstrasse 94, CH 8803 Rüschlikon; Sami Sandhaus, 4, Avenue de Provence, CH-1024 Lausanne, and Norbert Troger, Brüelweg 38, CH-4147 Aesch, all of Switzerland

Filed Sep. 10, 1984, Ser. No. 648,890

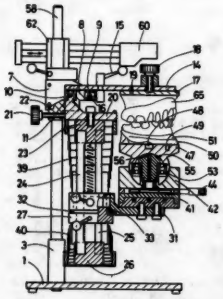
Claims priority, application Switzerland, Sep. 16, 1983, 5047/83

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—64 **10 Claims**

1. An occlusio-referential articulator comprising a frame on which are mounted an upper plane support **(14)** for the mold of the upper maxillary **(65)**, extending approximately horizontally and fixed in the position of use, a movable lower plane support **(47)** for the mold of the lower maxillary **(51)**, and means for displacing and positioning the lower plane support relative to the upper plane support both perpendicularly to the upper support and parallel to this support, wherein the lower support **(47)** comprises a movable piece **(27)** on a guide means **(24)** approximately perpendicular to the upper plane support **(14)** and said movable piece **(27)** is mounted to slide on two guide columns **(24,25)** of said guide means **(24)** and is suspended on at

least one weight-compensating spring (38) and said movable piece (27) supports (and supporting) an arm (31) which extends perpendicularly to said guide means (24) and is mounted to slide vertically on the said movable piece (27) with a limited travel and which is provided with a manually actuated stop means (34) for its vertical displacement on the said movable



piece (27), said arm (31) carrying two intersecting orthogonal slideways (41),(42), each provided with a graduated actuating screw, the upper slideway (42) carrying a spherical knuckle (46) which supports a plane table (47) possessing positioning means (48,49) for the mold of the lower maxillary or its support (50).

4,573,916

DEVICE FOR DETERMINING THE RELATIVE POSITION OF THE UPPER JAW AND LOWER JAW FOR THE PRODUCTION OF DENTURES

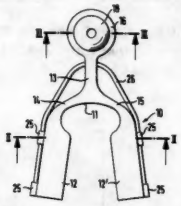
Robert Sturtzkopf, Wilhelm-Hey-Str. 14, 8000 Munich 60, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,395

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329284

Int. Cl.[4] A61C *9/00*

U.S. Cl. 433—71 **4 Claims**



1. A device for determining the mutual alignment of the chewing surfaces of the upper and lower jaw for the purpose of producing dentures, wherein a freely shapeable hardenable wadding is interposed between the upper and lower jaw which is allowed to harden once the chewing surfaces have been firmly closed on each other and wherein the wadding comprises a plastic bag in fork-like shape having a pair of shanks each adapted to be engaged by the molars at the respective sides of the mouth of a user, including a filling opening which is elongated in a tubular shape and communicating with the interior of the shanks, the improvement comprising said bag being recessed in the area of the frontal teeth sufficiently not to be engaged thereby when said shanks are engaged by the molars and providing tubular connections for connecting the shanks of the bag outside the area of the frontal teeth to each other and to the filling opening.

4,573,917

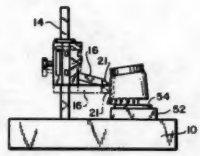
MEASURING DEVICE FOR MAXILLOFACIAL TRIAL SURGERY

Kim L. Erickson, 36 Lawrence Ave., Bedford Hills, N.Y. 10507

Filed Dec. 13, 1984, Ser. No. 681,371

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—75 **12 Claims**



1. A measuring device for orthognathic surgery utilizing the Frankfort Horizontal reference plane and for use in surgical planning comprising a model platform having a precisely flat platform surface representing the Frankfort Horizontal plane, a model block resting on said platform surface and provided with a dental model thereon that has been oriented relative to said model platform, a vertically movable caliper mounted on and 90 degrees to said platform and having means for accurately measuring said dental model, and a scriber maintained substantially parallel to said flat platform surface for accurately placing reference lines that have been measured by said caliper on said mounted dental model for facilitating prospective surgical procedures.

4,573,918

CLAMPING ARRANGEMENT FOR THE CLAMPING ENGAGEMENT OF INSTRUMENTS

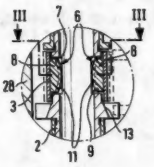
Erich Bareth, Ummendorf, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,125

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346248

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—127 **32 Claims**



1. In a clamping arrangement for the clamping of implement, such as dental instruments; including a mounting sleeve rotatably supported within a handpiece and connected with a rotary drive, and including an axially extending sidewall forming a socket to receive a shank of an instrument inserted thereinto; clamping means for gripping said shank; and an external spring element imparting a force on said clamping means; the improvement comprising:

the sidewall of the mounting sleeve forms at least one opening radially extending through said sidewall;

the clamping means are separate from and releasably mounted on aid mounting sleeve, and are supported by the mounting sleeve for radial movement through the opening in the sidewall thereof; and

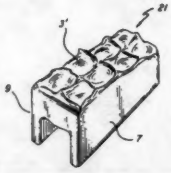
the external spring element is mounted on the clamping means and urges the clamping means radially inward through the opening in the sidewall of the mounting sleeve.

4,573,919

DENTURE STABILIZER FOR MUSICIAN

Frank Sinkora, 7875 French St., Northfield, Ohio 44067

Filed May 2, 1984, Ser. No. 606,381
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—140 7 Claims



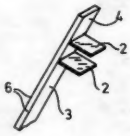
1. A denture stabilizer for musicians comprising a member having a flattened upper surface for engagement by the teeth extending from the musician's upper jaw and a flattened lower surface opposite said upper surface for engagement by the teeth extending from the musician's lower jaw, said upper and lower surfaces being spaced from each other by a distance small enough to maintain the musician's mouth in a substantially closed position, and one of said upper and lower surfaces having an irregular contour to engage the irregular surface of the teeth engaged by said surface, said stabilizer holding a denture comprising any said teeth in the musician's mouth in place against forces applied to the denture by the mouthpiece of a musical instrument.

4,573,920

DEVICE FOR CLEANING THE PROXIMAL FACES OF TEETH

Etienne Y. d'Argembeau, Rue de Belle-Vue, 24, B - 1050 Bruxelles, Belgium

Filed Apr. 19, 1984, Ser. No. 601,822
Claims priority, application Belgium, Apr. 29, 1983, 210669
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—141 4 Claims



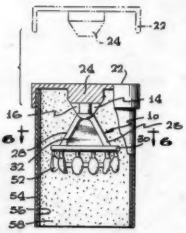
1. A device for cleaning the curved proximal side faces of teeth, comprising: an elongate handle (3), and two rectangular elastically deformable sheets (2) attached by one edge, opposite free edges thereof, to the handle, said sheets being disposed parallel to each other and each having a plane of symmetry which is substantially perpendicular to a longitudinal axis of the handle, the distance between two adjacent sheets being such that, when these sheets are pressed against the side face of two adjacent teeth, the free edges of both of said sheets follow the curved proximal faces of the two adjacent teeth and penetrate into the space between said adjacent teeth, wherein said distance between two adjacent sheets is less than the width of the smallest teeth, and is 1.5 to 3.0 mm.

4,573,921

PROSTHESIS AND APPARATUS FOR MOLDING THE PROSTHESIS

Robert P. Berger, 4421 Rochelle Pl., Encino, Calif. 91316

Filed Jun. 27, 1984, Ser. No. 625,112
Int. Cl.[4] B29C *33/52, 41/40*
U.S. Cl. 433—167 15 Claims



12. A molded article comprising:
a substantially central mold gate;
at least two elogated runners connected to said substantially central gate; and
a web connected to said runners substantially throughout their length, said web being thinner than said runners.

14. The article of claim 12 wherein said two runners are connected to said substantially central gate adjacent each other and said two runners diverge in a direction position away from said substantially central gate and a cross runner is connected to both of said divergent members away from said substantially central gate, said web being attached to said three runners to substantially close all opening between said runners viewed in a direction normal to said web.

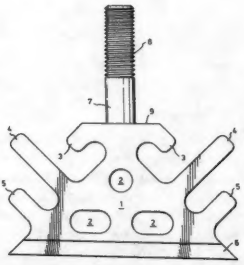
15. The article of claim 14 further including a dental prosthesis attached to said cross runner.

4,573,922

ARTIFICIAL ENDO-OSSEOUS PILLAR FOR SUPPORTING FIXED PROSTHETIC MEMBERS

Lino L. Bello, 39, Corso del Popolo, 38017 Mezzolombardo, Italy

Filed Jan. 13, 1984, Ser. No. 571,182
Claims priority, application Italy, Jan. 31, 1983, 47647 A/83
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—176 9 Claims



1. Artificial endo-osseous pillar for supporting a fixed oral prosthetic member, which consists of a biologically acceptable plate, substantially triangularly shaped, having on its surface a plurality of holes and along the oblique sides of said surface a plurality of projections and protrusions, said projections and protrusions being of various length and upwardly faced and symmetrical to opposed ones, said plate ending at its upper

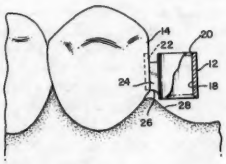
extremity in a vertical pin integral with a very small shoulder, said pin serving to fix a stump that protrudes into the oral cavity, said plate ending at its lower extremity in a rectilinear and conically tapered edge.

4,573,923

DENTURE CONNECTOR

Melvin D. Poveromo, Miami, Fla., assignor to George Poveromo; March Poveromo and Melanie Poveromo, all of Bay Harbor Islands, Fla.

Filed May 25, 1984, Ser. No. 614,078
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—181 **11 Claims**



1. A denture connector comprising:

a female member attached to a denture crown by a web portion having a curved edge to accommodate the crest of the gingiva;

a male member adapted to be received in the female member for rotation therein, said male member having at least one slit in the end thereof, said slit extending through the diameter of the male member and extending approximately one half its height, whereby the end of the male member may be compressed;

a sleeve for attachment to the male member after compression of said male member; and

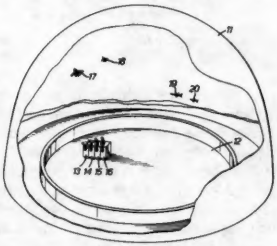
an attachment member extending from the male member for attaching the male member to adjacent denture material.

4,573,924

TARGET IMAGE PRESENTATION SYSTEM

Anthony Nordberg, Sussex, England, assignor to GQ Defence Equipment Limited, Godalming, England

Filed Nov. 9, 1984, Ser. No. 670,065
Claims priority, application United Kingdom, Nov. 14, 1983, 8330355
Int. Cl.[4] F41J *5/08*
U.S. Cl. 434—20 **12 Claims**



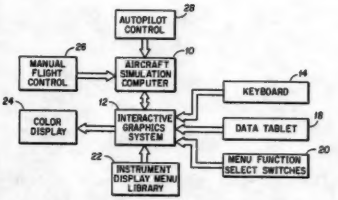
1. A target presentation system for displaying images of a target on the interior surface of a part-spherical dome to provide for an observer within the dome a visual representation of an aerial target flying a predetermined flight profile within an airspace surrounding the observer comprising projection means disposed in a predetermined position offset from the center of the dome for projecting an image carrying beam carrying target images corresponding to those which would be viewed by a ground observer during the flight of the target in the predetermined flight profile and means disposed adjacent the predetermined position offset from the center of the dome directing the image carrying beam to positions on the dome corresponding to those positions of a target traversing the airspace represented by the dome, the projection means including focus control means to maintain the image on the dome in focus throughout the visual representation of the predetermined flight profile for a predetermined position of the target presentation system within the dome offset from the centre of the dome.

4,573,925

ELECTRONIC FLIGHT INSTRUMENT DESIGN AND EVALUATION TOOL

C. James Styers, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 14, 1982, Ser. No. 418,105
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—49 **25 Claims**
MICROFICHE APPENDIX INCLUDED
(3 Microfiche, 293 Pages)



11. An instrument display design and evaluation system comprising:

means for generating a plurality of control signals representing varying parameters displayed by an instrument;

means for generating a plurality of individual display items, with each display item being associated with a different one of said varying parameters and including means for forming a menu of said display items;

means for selecting and displaying individual ones of said display items in the configuration of an instrument display; and

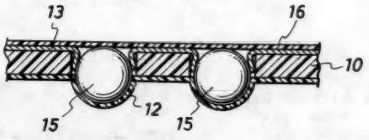
means for altering said display items in response to said control signals to reflect the dynamic operation of the instrument display in response to said changing parameters.

4,573,926

BRAILLE PRINT BOARD

Chozo Okada, 23-20, Yagiyamahoncho 1-chome, Sendai-shi, Miyagi-ken, Japan

Filed Dec. 31, 1984, Ser. No. 688,142
Int. Cl.[4] G09B *21/02*
U.S. Cl. 434—115 **4 Claims**



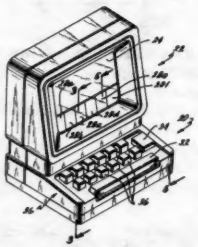
1. A braille print board comprising:

a print plate having a plurality of sets of 6-dot holes punched therein for forming braille letters;
a retaining sheet pressed onto one side of said plate;
a dot hole sheet pressed onto the other side of said plate, said dot hole sheet and said retaining sheet having braille letters in the form of punctures in said dot hole sheet and depressions in said retaining sheet, said punctures and depressions being aligned with said holes in said print plate and formed with a braille typewriter or a braille pen through said dot hole sheet;
balls placed in said holes through said punctures; and
a cover sheet pasted over said dot hole sheet so as to prevent said balls from dropping out of said holes.

4,573,927
MEANS AND METHOD OF SHOWING FEELINGS
Patricia T. Newman, 315 Shepard St., Raleigh, N.C. 27607
Filed Aug. 29, 1984, Ser. No. 645,235
Int. Cl.[4] G09B *19/00*; A63H *3/00*
U.S. Cl. 434—236 **9 Claims**

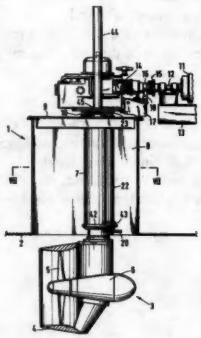
1. The method of teaching a child to accept and express emotional feelings comprising: giving said child a doll-like figure; giving said child at least four separate and removable facial panels, each depicting one of the commonly felt emotions of happiness, sadness, anger and fear; instructing said child to illustrate his/her feelings by attaching an appropriate facial panel to said doll corresponding to his/her feelings whereby a child is provided with a non-threatening means of expressing his/her feelings.

4,573,928
TEACHING TOY
Yoshizo Seki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 26, 1984, Ser. No. 665,101
Int. Cl.[4] G09B *3/02*
U.S. Cl. 434—348 **17 Claims**



1. A toy which comprises:
a housing;
an indicia carrier means movably located on said housing, said indicia carrier means including indicia located thereon;
a viewing means located on said housing in association with said indicia carrier means, said indicia carrier means movable with respect to said viewing means, said viewing means permitting viewing a first portion of said indicia on said indicia carrier means and in response to movement of said indicia carrier means with respect to said viewing means said viewing means permitting viewing a further portion of said indicia on said indicia carrier means;
a plurality of cover members arranged in an array on said housing between said indicia carrier means and said viewing means, each of said cover members capable of moving one at a time in a predetermined fixed sequence between a covered position and an uncovered position, each of said cover members capable of covering a portion of said viewable indicia when in its respective covered position;
operator interface means operatively associated with both said plurality of indicia cover members and said indicia carrier means, said operator interface means operable by an operator of said toy in response to operation of said operator interface means each of said plurality of indicia cover members sequentially moving from their respective covered position to their respective uncovered position to sequentially uncover greater and greater portions of said viewable indicia on said indicia carrier means followed by said indicia carrier means moving to said further position and said plurality of indicia cover members moving to their respective covered positions.

4,573,929
PROPELLER DEVICE FOR A SHIP
Jarmo Savikurki, and Kim Jansson, both of Rauma, Finland, assignors to Hollming Ltd., Finland
Filed Jan. 30, 1984, Ser. No. 574,992
Claims priority, application Finland, Feb. 3, 1983, 830373
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—54 **12 Claims**



1. A propeller device for a ship, said propeller device having a propeller, an upper part and a lower part, and a transmission system for transmitting rotation from an engine having an engine shaft to said propeller, said transmission system including a drive shaft in the upper part of said propeller device, said drive shaft being driven by said shaft of said engine, an upper angular gearbox coupled to said drive shaft, a vertical shaft coupled to said upper angular gearbox, a lower angular gearbox coupled to said vertical shaft, and a propeller shaft in the lower part of said propeller device coupled to said lower angular gearbox, said propeller device comprising
a coupling having a coupling member between said drive shaft of said propeller device and said engine shaft whereby said propeller device may be uncoupled from said engine via said coupling member, said coupling member being displaceable in axial directions, so that said propeller device may be raised,
said ship having a bottom and a well formed in said bottom,

said well having a top and a wall, said propeller device being positioned underneath the bottom of said ship in use, so that said propeller device may be raised into said well when out of operation, said propeller device further comprising raising means for raising said propeller device into said well, said raising means including a vertical hydraulic cylinder in said well alongside said propeller device, said cylinder having a bottom end affixed to said wall of said well and a top end affixed to the top of said well, a support plate supporting said propeller device at its lower part in said well, a slide ring mounted on said hydraulic cylinder and said hydraulic cylinder functioning as a guide, a piston in said hydraulic cylinder passing through the top of said well to above said top, and having an upper end affixed to the upper part of said propeller device, said piston producing a raising movement of said propeller device.

4,573,930

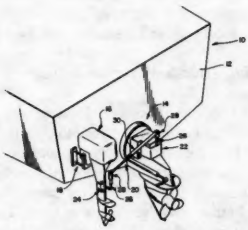
STEERING MECHANISMS FOR OUTBOARD MOTOR

Charles L. Queen, 2243 S. Highland Dr., Camano Island, Wash. 98292

Continuation-in-part of Ser. No. 339,612, Jan. 15, 1982, abandoned, which is a continuation of Ser. No. 67,806, Aug. 20, 1979, Pat. No. 4,311,471. This application May 10, 1982, Ser. No. 376,152

Int. Cl.[4] B63H *21/26*

U.S. Cl. 440—56 **11 Claims**



1. A remote steering device adapted for use in a boat comprising:

i. a main propulsion unit in operative engagement with a transom of said boat for rotation about a first axis between a first lower operating position and a second upper nonoperating position, said main propulsion unit being steerable from a cockpit portion of said boat;

ii. an auxiliary outboard motor mounted externally of said boat to said transom for rotation about a second axis between a first lower operating position and a second upper nonoperating position; said remote steering device adapted for slaving attachment of said auxiliary outboard motor to said main unit in order to steer said auxiliary outboard motor from said cockpit portion of said boat by steering said main unit, said remote steering device comprising:

a. a first bracket adapted to be mounted to said main unit;

b. a first ball joint connected to said first bracket, said first ball joint having a first ball housing and a first ball member mounted in the first ball housing for rotation about three axes mutually perpendicular to one another;

c. a second bracket adapted to be attached to said auxiliary outboard motor;

d. a second ball joint connected to said second bracket, said second ball joint having a second ball housing and a second ball member mounted in the second ball housing for rotation about three axes mutually perpendicular to one another; and

e. automatically adjustable connecting rod means connected between said two ball joints, said rod means comprising:

1. a first tubular rod member having a first end connected to one of said ball joints and having a second end portion;

2. a second rod member having a first end connected to another of said ball joints and a second end portion which extends into the second end portion of the first rod member in telescoping relationship, said second rod member being rotatably engaged by said first rod member for rotation about a lengthwise axis of said second rod member relative to said first rod member;

3. the second end portion of the second rod member being formed with a plurality of arcuate grooves spaced from one another along the lengthwise axis of the second rod member, each of said grooves being positioned generally in a plane transverse to said lengthwise axis;

4. biased pin means mounted in the second end portion of the first rod member to releasably engage the grooves of the second end portion of the second rod member, in a manner that when said pin means is engaging one of said grooves and a predetermined force exerted between said first and second rod members parallel to said lengthwise axis is exceeded, said pin means moves out of the groove which it is engaging to permit said second rod member to move axially relative to said first rod member so that said pin means comes into engagement with another of said grooves to provide an incremental length adjustment of said connecting rod means.

4,573,931

ATTACHMENT MEANS FOR OUTBOARD MOTORS

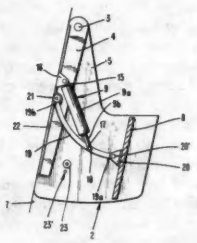
Verner Andersson, Stationsgatan 1B, and Kaj Andersson, Kaskö plan 5, both of 824 00 Hudiksvall, Sweden

Filed Oct. 30, 1984, Ser. No. 666,348

Claims priority, application Sweden, Nov. 1, 1983, 8306003

Int. Cl.[4] B63H *5/12*

U.S. Cl. 440—61 **9 Claims**



1. An assembly for attaching an outboard motor to a boat hull, said assembly comprising:

an attachment base affixable to the boat hull;

an attachment housing having a support section for receiving an outboard motor;

means for pivotably attaching said attachment housing to said attachment base so that said attachment housing is angularly positionable about a first, approximately horizontal axis;

a lever arm having a first end and a free end;

means for pivotably attaching said first end of said lever arm to said attachment housing so that said lever arm is pivotable about a second, approximately horizontal axis;

stop means fixed to said attachment housing for limiting the pivoting motion of said lever arm;

controlled means connected to said lever arm at a location between said free end and said first end for selectively adjusting the angular position of said attachment housing, said controlled means adjusting the angular position of said attachment housing according to trim by pivoting said lever arm about said second axis with said free end in

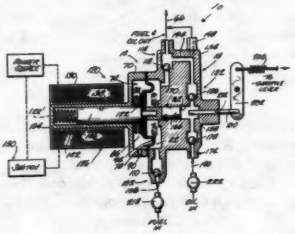
contact with and moving along said boat hull between a first lever position spaced from said stop means and a second lever position adjacent said stop means, said controlled adjusting means adjusting the angular position of said attachment housing to a tilting position by urging said lever arm against said stop means.

4,573,932

ELECTRICAL FLUID PUMPING DEVICE INCLUDING FIRST AND SECOND PUMPING PORTIONS

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 8, 1984, Ser. No. 578,024
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—88 12 Claims



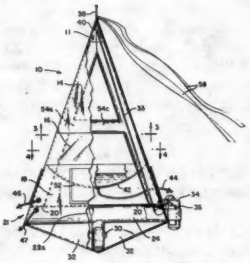
1. A marine propulsion device comprising a propeller, a lower unit rotatably supporting said propeller, an upper unit supported by said lower unit and including an engine including a crankshaft and carburetion means for supplying fuel to said engine, drive train means driven by said crankshaft for rotating said propeller, and a fluid pumping device comprising a pump housing defining a recess, a movable wall which is in said recess and which cooperates with said recess to define a variable volume fuel pumping chamber, a fuel inlet in communication with said fuel pumping chamber and adapted to communicate with a source of fuel, check valve means in said fuel inlet permitting fuel flow into and preventing fuel flow from said fuel pumping chamber, a fuel outlet in communication with said carburetion means and said fuel pumping chamber, check valve means in said fuel outlet for permitting fuel flow from and preventing fuel flow into said fuel pumping chamber, biasing means for moving said movable wall in one direction, solenoid means comprising a plunger connected to said movable wall, and solenoid coil means for moving said plunger and said movable wall in an opposite direction against the action of said biasing means, a bore which is in said pump housing and which extends perpendicularly from said movable wall and which partially defines a variable volume oil pumping chamber, a piston which is received in said bore and which includes a first end attached to said movable wall and a second end cooperating with said bore to form said variable volume oil pumping chamber, an oil inlet in communication with said oil pumping chamber and adapted to communicate with a source of oil, check valve means in said oil inlet for permitting oil flow into and preventing oil flow from said oil pumping chamber, an oil outlet in communication with said engine and said oil pumping chamber, and check valve means in said oil outlet for permitting oil flow from and preventing oil flow into said oil pumping chamber.

4,573,933

FLOATING SEARCH AND RESCUE INFLATABLE PYRAMID

Robert W. Cameron, #60 Lakeshore Plaza, Suite 1, Kirkland, Wash. 98033

Filed Jun. 20, 1983, Ser. No. 506,042
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—16 8 Claims



1. A pyramid-shaped floating search and rescue inflatable signal and safety mechanism, comprising:

an inflatable base comprising a plurality of horizontally disposed base tubes, and a centrally positioned depending inflatable anchor tube extending downwardly and containing a weight;

a plurality of inflatable beams extending upwardly from the base to an apex;

flat panels of flexible sheet material extending between said inflatable beams to form a first pyramidal surface, said panels including an upper radar reflective panel portion, a lower colored panel portion, and a translucent panel portion positioned between said upper and lower panel portions;

a solar still mechanism positioned within the enclosure formed by said first pyramidal surface; and

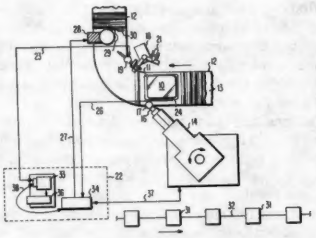
flexible sea anchor panels stretched from said base tubes to the lowermost end of said inflatable anchor tube, said sea anchor panels having flood ports therein for restricted entry and exit of water and forming a second, depending pyramidal surface.

4,573,934

SYSTEM FOR IDENTIFYING ENVELOPES HAVING EXCESSIVE PANEL-FUNNEL OFFSET AND DISPENSING ARTICLES

Douglas A. Strouse, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1984, Ser. No. 636,256
Int. Cl.[4] H01J *9/26;* B23Q *7/12*
U.S. Cl. 445—3 12 Claims



1. A system for measuring the panel-funnel offset of tube

envelopes and for dispensing identification articles onto the fixtures of rejected envelopes comprising:

means for measuring said panel-funnel offset and providing a measured offset value;

means for sensing the size of said envelope and providing a size signal to identify said envelope as one of several envelope sizes;

means for dispensing an identification article onto the fixture of envelopes having an excessive panel-funnel offset;

means for placing a reject mark on envelopes having an excessive panel-funnel offset;

programmable control means for receiving said measured offset value, said control means having a stored designed offset value for each of said envelope sizes and an offset tolerance value for all of said envelope sizes; said control means including first comparison means for receiving said measured offset value and one of said designed offset values in accordance with said size signal and providing an offset difference, second comparison means for receiving said offset difference and said offset tolerance for providing a reject signal when said offset difference exceeds said offset tolerance whereby said reject signal actuates said means for dispensing and said means for placing to dispense an identification article onto said fixture and to place a reject mark onto said envelope.

4,573,935

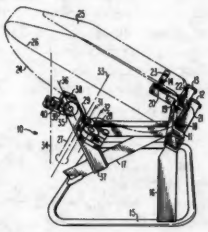
SEALING FIXTURE FOR COLOR KINESCOPES

Myron H. Wardell, Jr., Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1984, Ser. No. 572,152

Int. Cl.[4] H01J *9/24*

U.S. Cl. 445—66 **6 Claims**



1. A fixture for supporting and accurately positioning the faceplate panel and funnel of a substantially rectangular kinescope envelope during the fritting together of said panel and said funnel, said panel and said funnel having mating sealable edges along which fritting occurs, and said funnel including a neck portion affixed to the remainder of said funnel through a contoured portion; said fixture comprising:

a referencing frame configured to engage at least two adjacent sides of said panel and said funnel, said frame being tilted with respect to a vertical axis whereby the longitudinal axis of said funnel supported by said fixture tilts toward the juncture of said two sides;

a plurality of support members fixed to said referencing frame along both of said two sides, each of said support members supporting a funnel referencing element and a panel referencing element, said funnel referencing elements being spaced a first predetermined distance from said frame whereby at least two of said funnel referencing elements contact one of said sides of said funnel in the proximity of said sealable edge and at least one of said funnel referencing elements contacts the other side of said funnel in the proximity of said sealable edge, said funnel referencing elements being rotatable about fixed axes substantially parallel to said frame, said panel referencing elements being spaced a second predetermined distance from said frame whereby said panel referencing elements contact said two sides of said panel;

a plurality of neck positioning means arranged to receive said neck portion in the proximity of said contoured portion, said neck positioning means being rotatable about axes extending substantially parallel to one another and being tilted with respect to a vertical axis whereby said neck portion is gravity centered between said neck positioning means by rotation of said neck positioning means; and

funnel urging means positioned to contact said contoured portion and urge said funnel toward said funnel referencing elements, said funnel urging means being a disc-shaped member rotatable about a fixed axis angularly disposed with respect to said funnel longitudinal axis.

4,573,936

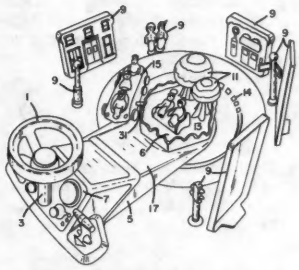
DRIVING TOY

Tobin Wolf, 285 Ayerigg Ave., Passaic, N.J. 07006

Filed Oct. 3, 1983, Ser. No. 538,543

Int. Cl.[4] A63H *17/14*

U.S. Cl. 446—7 **19 Claims**



1. A system for driving a toy along a predetermined path on a surface of varying height about a base member, comprising:

(a) a base member, first rotatable means mounted in said base member,

(b) a toy, and

(c) second means mounted in said base member and being responsive to rotation of said first rotatable means for driving said toy along said surface; said second means comprising a first rotatable arm rotatable about a pivot for rotary movement in a first plane, a second rotatable arm pivotably secured to said first arm for rotation in a second plane normal to said first plane, and

(d) means for detachably coupling said toy to said second arm to cause movements of said toy corresponding to movements of said second arm in either plane,

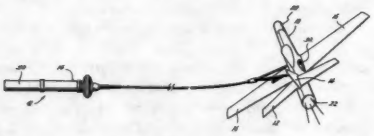
(e) said second means including a section of a disc secured to and rotatably responsive to rotation of said first rotatable means, means to limit rotation of said disc to a predetermined angle, a rigid member pivotably secured to said disc and movable in a reciprocating manner responsive to disc rotation, ratchet means including a ratchet wheel, said ratchet means being connected to said rigid member and responsive to a reciprocation cycle of said rigid member to rotate said ratchet wheel in only one direction, said first arm being rigidly secured to said ratchet wheel.

4,573,937

JET PROPELLED MODEL AIRPLANE

Victor Stanzel, P.O. Box 28, Schulenburg, Tex. 78956

Filed Jul. 19, 1984, Ser. No. 632,388
Int. Cl.[4] A63H *27/04*
U.S. Cl. 446—31 12 Claims



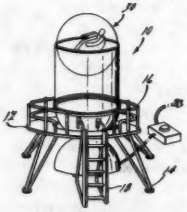
1. A toy aircraft comprising:
an elongated body having wings and a tail assembly attached thereto;
centrifugal fan means housed within said body for powering said aircraft;
a hand-held remote drive unit for driving said fan means, said remote drive unit comprising,
an electric motor, and
switch means for selectively operating said electric motor;
an elongated flexible drive cable extending between and operatively connected to said remote drive unit and said centrifugal fan means for rotatively driving said centrifugal fan means from said drive unit; and
means for controlling the rate of acceleration of said fan means when said electric motor is switched on and for controlling the rate of deceleration of said fan means when said motor is switched off, said means comprising a flywheel disposed in said hand-held remote drive unit and operatively connected to at least one of said electric motor and said elongated flexible drive cable.

4,573,938

SPACESHIP TYPE TOY

Mark S. Sassak, 2405 Arends, Las Vegas, Nev. 89102

Filed Feb. 27, 1984, Ser. No. 583,657
Int. Cl.[4] A63H *33/40, 17/00, 27/00*
U.S. Cl. 446—179 10 Claims



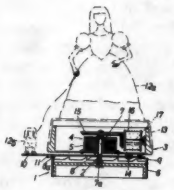
10. A spaceship type toy comprising, in combination:
a space capsule including an upper spherical portion, and a lower spherical portion engaging said upper spherical portion,
an elongated tube oriented substantially vertically, said tube closely receiving said capsule and having an upper opened end, defined by a perimenter edge lying substantially along a horizontal plane
a base supporting said tube,
a fan duct installed within said base and communicating with the vertically lower end of said tube, and
fan means installed within said fan duct, said fan means supplying air pressure to said tube such that said capsule may be translated within said tube to said upper end of said tube such that a portion of said capsule extends above said perimeter edge, while a remaining portion of said capsule remains within said tube.

4,573,939

TOY MUSIC BOX

Chojiro Hoshino, 5-18-1 Kamimuneoka, Shiki-shi, Saitama-ken, Japan

Filed Apr. 25, 1984, Ser. No. 603,638
Claims priority, application Japan, Apr. 27, 1983, 58-63653[U]
Int. Cl.[4] A63H *13/02*
U.S. Cl. 446—298 1 Claim



1. A toy music box wherein a table having an ornament is rotatably coupled to a stationary platform and rotated by being driven in a first rotational direction relative to said platform by a driving means within said music box, the toy music box being characterized by:
a rod having one end rotatably coupled to said table at a point eccentric to the axis of rotation of said table, another end of said rod extending out beyond the edge of said table;
an ornament coupled to said another end of said rod;
a spring means attached to said table and coupled to said one end of said rod to bias said another end of said rod relative to said table in said first rotational direction;
a protrusion attached to said rod; and
means including a plurality of protrusions provided on said platform for selectively engaging with said protrusion on said rod;
whereby said rod cyclically is stopped from rotating with said table in said first direction by said protrusion on said rod engaging with one of said plurality of protrusions on said platform as said base rotates and is then released after a predetermined rotation of said table to rotate in said first rotational direction, moving at first relative to said table and then therewith until said protrusion on said rod engages with another of said plurality of protrusions on said platform.

4,573,940

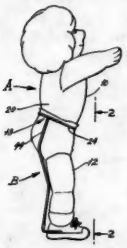
DOLL AND MEANS FOR STANDING SAME

Robert A. Showers, 325 E. Third, Alton, Ill. 62002

Filed Apr. 23, 1984, Ser. No. 602,810
Int. Cl.[4] A63H *3/46*
U.S. Cl. 446—376 7 Claims

1. In combination with a doll having intrinsically flexible leg components permitting the doll's legs to move relative to its torso, a doll stand detachably securable to said doll and including means for extrinsically maintaining the doll legs in inflexible condition relative to its torso, and comprising:
left and right relatively rigid leg-brace elements having a length at least as great as the doll's legs,
independent respective, ankle-engaging means carried at the lower ends of the leg-brace elements for independently attaching to ankles of the doll, and
torso securement means interconnected with the upper ends of each of the leg-brace elements for mutual securement thereof to the torso of the doll and for maintaining the respective leg-brace elements along the doll's legs for preventing bending thereof relative to its torso,

said leg-brace elements extending downwardly from said torso securement means at the back of the respective doll legs so as to be visibly obscured from the front of the doll,



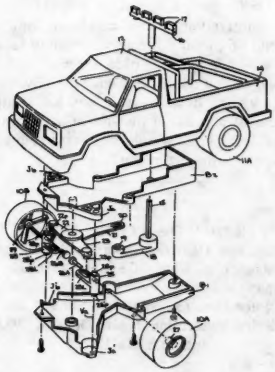
whereby the doll is maintained in stiff-legged condition for permitting it to remain in a self-supported, standing position with its weight resting on its feet.

4,573,941

STEERABLE TOY VEHICLE

John Holden, Mt. Joy, Pa.; Sam Colombrito, Old Bridge, N.J., and Arthur H. Jeffreys, York, Pa., assignors to Buddy L Corp., New York, N.Y.

Filed Aug. 23, 1984, Ser. No. 643,394
Int. Cl.[4] A63H *17/38*
U.S. Cl. 446—451 **4 Claims**



1. A steerable, four-wheeled toy vehicle comprising:

A. right and left front wheels and right and left rear wheels supported for rotation on the chassis of the vehicle;

B. a vertical steering post having a handle secured to the upper end thereof at a raised position with respect to the body of the vehicle so that it can be manipulated by a player, the post extending through the chassis and terminating in a crank at the underside of the vehicle at right angles to the post;

C. a T-shaped lever having a leg pivotally connected to the crank and right and left outstretched arms on either side of the leg, the fulcrum of the lever being at the junction of the leg and the arms, whereby when the crank is turned by the post in one direction, the arms of the lever are caused to swing in the opposite direction;

D. a bearing provided with axially extending end pivots for each of the front wheels for receiving a short wheel axle anchored in the hub of the related front wheel, the pivots of said bearings being journaled at fixed points on opposite sides of the longitudinal axis of the vehicle, each for rotation about a respective vertical axis normal to the wheel axle, the bearing for the right front wheel being pivotally coupled to the right arm and the bearing for the left front wheel being pivotally coupled to the left arm of the lever, each bearing having a lateral lug with a slot therein which receives a pivot pin on the associated lever arm whereby when the steering post is turned by the handle, the front wheels are steered so that they both assume the same angle with respect to the longitudinal axis of the vehicle but do not otherwise shift with respect to said fixed points;

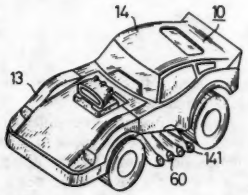
E. A two-piece box secured to the underside of the vehicle and enclosing the crank, the lever and the pivoted couplings between the bearings and arms, said box defining the journals for the pivots of said bearings.

4,573,942

MOTOR VEHICLE WITH ELONGATION MEANS AND MOVABLE EXHAUST

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co. Ltd., Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 524,522
Claims priority, application Japan, Sep. 30, 1982, 57-148146; Nov. 1, 1982, 57-164560[U]
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—457 **4 Claims**



1. A toy vehicle capable of elongated reconfiguration comprising:

a front body portion configured to simulate the front of a vehicle;

a rear body portion configured to simulate the rear of a vehicle;

means for driving the toy vehicle across a support surface;

means interconnecting the front and rear body portions in a movable arrangement on a common longitudinal axis, the front and rear body portions being movable along the longitudinal axis from a position adjacent each other to a position apart from each other whereby the vehicle can assume an elongated vehicle configuration with a space between said body portions, said interconnecting means including means for securing said body portions in said adjacent position and means biasing said body portions toward said apart position;

two sets of simulated motor exhaust pipes connected to the toy vehicle and extending respectively outwardly on each side of the body portions in directions approximately perpendicular to the longitudinal axis;

means for pivotally mounting the sets of exhaust pipes so that they are positioned in a lower initial position when the front and rear body portions are positioned adjacent to each other and are automatically positioned in a relatively higher raised position between the front and rear body portions to provide a more racey appearance when the front and rear body portions are released to be configured in the elongated vehicle configuration; and

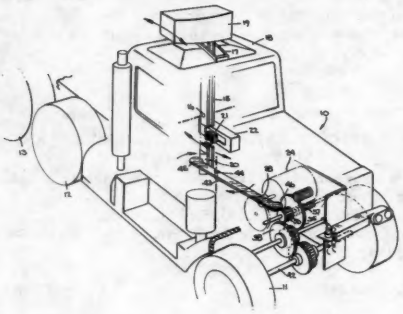
means associated with said driving means for automatically releasing said securing means to permit said reconfiguration as said vehicle is driven across said support surface.

4,573,943

MOTORIZED TOY VEHICLE

Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham A. Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Filed Dec. 18, 1984, Ser. No. 683,045
Int. Cl.[4] A63H *29/24*
U.S. Cl. 446—463 2 Claims



1. A toy vehicle provided with a set of wheels mounted on an axle, said vehicle comprising:

(A) a bi-directional d-c motor operatively coupled to the wheel axle through a clutch which is engageable to cause the axle to turn in a direction determined by the polarity of the voltage applied to the motor, said motor being provided with an elongated output gear which is coupled by the clutch to an input gear of a gear train whose final gear is mounted on the wheel axle, said clutch being constituted by a clutch gear axially shiftable on a shaft and engaging said elongated motor output gear regardless of its axial position, said clutch gear having a pinion on one face thereof which engages its input gear on the gear train only when said clutch gear is urged by a spring pressing against its other face into an axial position affecting such engagement;

(B) an independent polarity-reversing switch provided with an actuator connecting a battery to the motor, said switch being shiftable from a neutral position in which the battery is disconnected from the motor to either a forward position in which the battery is connected to the motor in one polarity or a reverse position in which the battery is connected to the motor in the opposite polarity; and

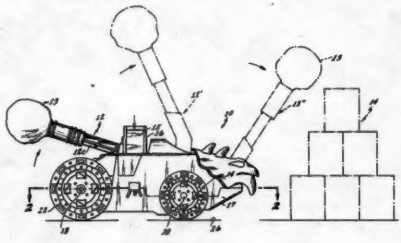
(C) a shift stick mechanism operatively linked both to the clutch and to the actuator of the switch so that when the stick is in its neutral position, the switch is in the corresponding position and the clutch is disengaged whereby the vehicle then free rolling; and when the stick is in its forward position, the switch is in the corresponding position and the clutch is then engaged to drive the wheels in the forward direction; and when the stick is in its reverse position, the switch is in the corresponding position and the clutch is then engaged to drive the wheels in the reverse direction; said shift stick mechanism including a cam head on one end of the stick engaged by a cam follower on one end of a pivoted lever on whose other end is a finger which engages the face of the clutch gear, said head having a peak and slopes on either side thereof whereby when the cam follower rests on the peak in the neutral position of the stick and of the switch, it swings the lever to cause the finger to effect disengagement of the clutch gear.

4,573,944

BALL SWINGING TOY VEHICLE

Granville Crow, Lomita; Larry H. Renger, Hawiian Gardens, and Roger H. Sweet, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 4, 1985, Ser. No. 688,837
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—465 15 Claims



1. In combination with a toy vehicle including a housing, an axle coupled to said housing, and at least one ground-engaging wheel on said axle for moving said vehicle to different positions on a supporting surface, the improvement which comprises:

an arm member having a first end coupled to said axle for pivotable movement relative to the vehicle;

simulated weight means affixed to the other end of said arm member;

manually operable control means on said vehicle; and

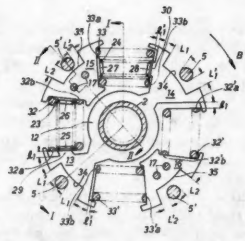
means interoperatively interconnecting said control means and said first end of said arm member including rack and pinion means for enabling pivoting of said arm member in response to operation of said control means, whereby said arm member may be swung from a nested position relatively within said vehicle to a position outside of said vehicle thereby bringing said simulated weight means into engagement with an object or the supporting surface.

4,573,945

DAMPER DISC OF A LONG TRAVEL TYPE

Kouji Kajitani, and Hirotaka Fukushima, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 13, 1984, Ser. No. 681,316
Claims priority, application Japan, Dec. 22, 1983, 58-243146
Int. Cl.[4] F16D *3/14*
U.S. Cl. 464—68 6 Claims



1. A damper disc of a long travel type comprising a hub adapted to be connected to an output shaft; a pair of circumferentially spaced flanges projecting radially outwardly from the outer periphery of the hub; a pair of side plates connected to a torque input portion, disposed at both sides of the flange and rotatably fitted around the hub; spacers circumferentially

spaced to the flanges; sub-plates rigidly holding the spacers and rotatably fitted around portions of the hub between the side plates and the flange; a first friction member disposed between the flange and the sub-plate; a second friction member disposed between the sub-plate and the side-plate; a first spring always circumferentially connecting the flange and the sub-plates in a first torsion operation in which a relative torsion angle between the flange and the sideplates is lower than a predetermined value; second and third springs disposed circumferentially between the side plates and the flange with the spacers therebetween, the second and third springs being arranged to act in series and adapted to circumferentially connect the flange and the side-plates in a second torsion operation in which a relative torsion angle between the flange and the sideplates is larger than the predetermined value but less than another larger value of the relative torsion angle; and one of the second and third springs being connected between the flange and the sideplates during a third torsion operation where the relative torsion angle is greater than said larger value.

4,573,946

DRIVELINE

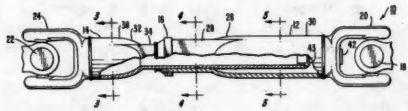
Ronald N. Brissette, Medina, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 15, 1983, Ser. No. 513,944

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] F16J *15/32*; F16D *3/06*

U.S. Cl. 464—133 **7 Claims**



1. A slip-type driveline assembly comprising:

a first member with a generally polygonal cross section, said first member having a first end with means for connecting it to a cross of a universal type joint and a second end having an opening into a cavity within the body of said first member, said cavity having a generally polygonal cross section, wherein the outer surface of one wall of said second end of said first member includes a transverse groove;

a second member having a first end portion, a central portion, and a second end portion, said first and central portions being slidably received into said cavity of said first member through the second end of said first member, the outer surface of said first end portion of said second member generally complementing the inner surface of said polygonal cavity of said first member, said central portion having a generally polygonal cross section with smooth surface, said second end portion of said second member having means for connecting it to a cross of a universal type joint; and

a resilient one-piece sealing member including:

(a) four first walls being joined such that said first walls form a square cross section with a square opening, said cross section forming a plane that is perpendicular to the longitudinal axis of said driveline assembly,

(b) four radially inwardly extending second walls joined to an end of a said corresponding first wall,

(c) radially inwardly converging truncated square pyramidal walls, the radially outward ends of said pyramidal wall being joined to the radially inner ends of said second walls,

(d) four radially outwardly extending reinforcing rib members joined to the radially inner end of said pyramidal walls wherein the square cross section formed by the inner section of said reinforcing rib members with said pyramidal walls is slightly less than the cross section of said second member that slidably passes therethrough, and

(e) means for mounting said sealing member at the second end of said first member, said mounting means including at least one radially inwardly extending ridge member on the inner surface of one of said first walls and integral therewith, said ridge member being transversely disposed to the longitudinal axis of said driveline assembly and fits into and generally complements the transverse groove.

4,573,947

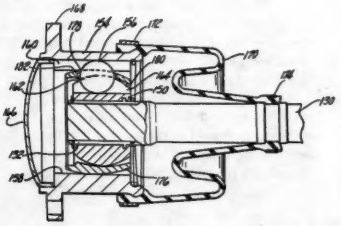
CONSTANT VELOCITY UNIVERSAL JOINT

Daniel W. Hazebrook, Detroit; Glenn F. Gehrke, Brighton, and Michael J. Schmidt, Grosse Pointe Park, all of Mich., assignors to GKN Automotive Components, Inc., Southfield, Mich.

Continuation of Ser. No. 459,722, Jan. 20, 1983, abandoned, which is a division of Ser. No. 183,757, Sep. 3, 1980, abandoned. This application Sep. 4, 1984, Ser. No. 646,494

Int. Cl.[4] F16D *3/02*

U.S. Cl. 464—146 **11 Claims**



6. A constant velocity joint comprising:

an outer joint member having a cylindrical portion, said cylindrical portion having an axis and a plurality of longitudinal grooves along an inner cylindrical surface;

an inner joint member coaxially mounted with said outer joint member for cooperation therewith, said inner joint member having an axis common with said axis of said outer joint member and a plurality of longitudinal grooves substantially parallel to said plurality of longitudinal grooves in said outer joint member, said inner joint member further having an outer contoured surface;

a plurality of spherical members mounted in said plurality of longitudinal grooves of said inner and outer joint members for transmitting torque between said inner and outer joint members, said plurality of spherical members each having a predetermined spherical radius having a center of curvature lying in a plane normal to said common axis of said inner and outer joint members, said normal plane intersecting said common axis, said intersection of said normal plane and said common axis being a joint center;

an annular restraining member centrally disposed between said inne and outer joint members, said annular restraining member further comprising:

a part-spherical outer surface cooperating with said inner cylindrical surface of said outer joint member, said part-spherical outer surface having a first generating radius with a center of curvature lying in a plane normal to said common axis of said inner and outer joint members, said normal plane intersecting said common axis at a first predetermined distance from said joint center;

an inner spherical surface disposed adjacent said part-spherical outer surface, said inner spherical surface and said part-spherical outer surface having portions defining a plurality of apertures interposed between said part-spherical outer surface and said inner spherical

surface, each one of said plurality of spherical members being located respectively in each one of said plurality of apertures, said inner spherical surface having a second generating radius with a center of curvature located on said common axis, said center of curvature of said second generating radius being spaced along said common axis a second predetermined distance from said joint center, said second predetermined distance being equal to and opposite from said first predetermined distance such that said first and second predetermined distance lie on opposite sides of said joint center; and

means providing a first limited relative axial movement of said inner joint member relative to said outer joint member to permit said pluralities of spherical members to roll in said plurality of longitudinal parallel grooves of said inner and outer joint members as said inner joint member moves axially relative to said outer joint member, said means further comprising means providing a second limited relative axial movement of said inner joint member relative to said annular restraining member, said means providing a second limited relative axial movement being integral with said outer contoured surface of said inner joint member and located centrally about said center of said second generating radius whereby when said inner joint member moves axially relative to said outer joint member, said inner joint member moves a second limited axial distance relative to said annular restraining member prior to said annular restraining member moving axially relative to said outer joint member so that the force required to transmit torque between said inner and outer joint members is reduced and said joint members isolate vibrations from being transmitted while maintaining the torsional characteristics of said constant velocity joint.

4,573,948

SPEED VARIATOR PULLEY

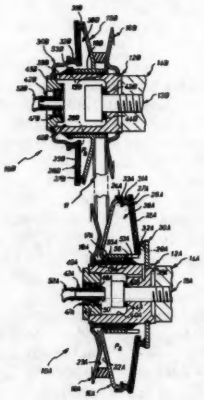
Jacques Thirion de Briel, Levallois Perret, France, assignor to Valeo, Paris, France

Filed May 15, 1984, Ser. No. 610,512

Claims priority, application France, May 16, 1983, 83 08047

Int. Cl.⁴ F16H *11/04*

U.S. Cl. 474—28 **11 Claims**



1. A variable speed pulley device comprising a hub, two annular flange plates disposed around said hub and facing each other, one of said flange plates being a movable flange plate and mounted for axial movement relative to said hub against the bias of a diaphragm spring, said diaphragm spring bearing axially against a peripheral part of said movable flange plate for rocking movement, and a central part of said diaphragm bearing axially against a support member fixed axially relative to said hub, and a pressure regulating chamber adapted to be connected by a fluid passage to a source of pressurized fluid; said pressure regulating chamber comprising an at least partially fluid-tight enclosure defined by said movable flange plate, said diaphragm spring, said support member and said hub.

4,573,949

DERAILLEUR FOR A BICYCLE

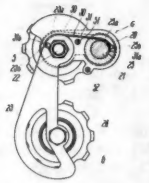
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 14, 1983, Ser. No. 551,585

Claims priority, application Japan, Nov. 17, 1982, 57-202657; Jan. 19, 1983, 58-7649

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—80 **6 Claims**



1. A derailleur for a bicycle comprising a base member, a movable member, and a support means for supporting said movable member so that it is movable axially relative to a multistage sprocket assembly for the bicycle with respect to said base member; said movable member including a guide mechanism which guides a driving chain to one sprocket at said multistage sprocket assembly, said guide mechanism comprising a first support member supported swingably to said movable member through a first pivot shaft and having a free end, a second support member supported swingably to the free end of said first support member through a second pivot shaft and having a free end, a guide pulley mounted rotatably to the free end of said first support member, and a tension pulley mounted rotatably to the free end of said second support member; said guide mechanism further comprising a rotary member mounted rotatably around said first pivot shaft, a tension spring interposed, between said rotary member and said movable member, for rotating said rotary member in the direction of imparting tension to said chain; and an interlocking mechanism interposed between said rotary member and said second support member for allowing an elastic force of said spring to act on said second support member in a predetermined ratio.

4,573,950

CHAIN GUIDE IN A FRONT DERAILLEUR

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 20, 1984, Ser. No. 622,583

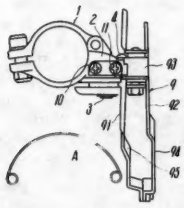
Claims priority, application Japan, Jun. 24, 1983, 58-98468[U]

Int. Cl.⁴ F16H *7/18*

U.S. Cl. 474—80 **3 Claims**

1. A chain guide for a front derailleur associated with a front chain gear assembly having at least three chain gears of different diameters, said derailleur for switching a driving chain from one front chain gear to another for changing bicycle gear speeds, comprising an inner guide plate and an outer guide plate, each comprising an elongate and lengthwise curved plate and being substantially parallel to each other, said plates being spaced at an interval larger than a width of said chain and supported movably axially of said front chain gears, said outer guide plate having an outer plate chain biasing region

which comes into contact with said chain and biases said chain toward an inner smaller diameter front chain gear when said chain is switched thereto from an outer larger diameter front chain gear and an outer plate chain moving region having an



outside swollen portion swollen outwardly with respect to said front gears, said outside swollen portion enabling said chain to move when switched to said inner smaller diameter front chain gear, said outer plate chain moving region being positioned below said outer plate chain biasing region.

4,573,951

DERAILLEUR FOR A BICYCLE

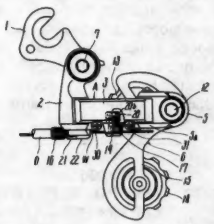
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 23, 1984, Ser. No. 592,787

Claims priority, application Japan, Mar. 30, 1983, 58-47183[U]

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—82 **5 Claims**



1. A derailleur for a bicycle comprising a four member linkage mechanism which is transformable and has a base member, a pair of linkage members, a movable member having a chain guide, and four connecting shafts for connecting said four members; a mounting base for a control wire which is fixed to one of said four members of said linkage mechanism, said mounting base entering into a space surrounded by said four members of said linkage mechanism, an entering portion of said base having a receiving portion for said control wire and a through bore extending in the same direction as said connecting shafts; and, at least one tightening member fitted into said through bore at said base to fixedly press a control wire onto said wire receiving portion at said base, said tightening member extending in the same direction as said connecting shafts and having at, at least one lengthwise end, a control portion operable from above said linkage mechanism when said derailleur is mounted on a bicycle.

4,573,952

TENSIONING DEVICE WITH A CONTROL MECHANISM FOR THE TENSION OF A BELT

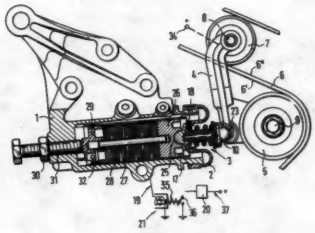
Heinz Schulze, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,891

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304543

Int. Cl.⁴ F16H *7/08*

U.S. Cl. 474—110 **14 Claims**



1. A tensioning installation with a device for controlling the tension of a belt, comprising tensioning roller means, a tensioner housing means, and pressure means, the tensioning roller means being pressed against the belt by way of the pressure means being longitudinally displaceable within the tensioner housing means, said pressure means including an electric contact means responding to the tensioning force, said contact means being operable to trigger a warning signal at an indicating apparatus in case of a non-permissively reduced tension of the belt, said pressure means including said electric contact means having an electrically conducting contact pin, an insulating sleeve centered and fixed on the contact pin, an electrically conducting contact sleeve longitudinally guided on the insulating sleeve, and a compression spring stressed between a collar of the insulating sleeve and a recess of the contact sleeve, the contact means being located between an end face of the contact pin and a conical bottom of the contact sleeve.

4,573,953

DRIVING BELT

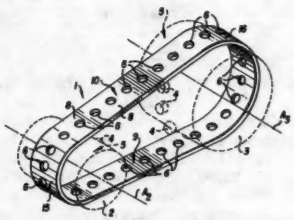
Giorgio Tangorra, Monza, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed May 3, 1984, Ser. No. 606,627

Claims priority, application Italy, May 4, 1983, 20924 A/83

Int. Cl.⁴ F16H *55/30, 7/02*

U.S. Cl. 474—152 **6 Claims**



1. A continuous driving belt of elastomeric material adapted for transmitting movement between two pulleys having external cylindrical surfaces, each of the pulleys being rotatable around an axis and also being provided with pins projecting radially from said external surface and adapted for insertion into corresponding holes made in the belt itself when the wound lengths of the belts stay in contact over the whole

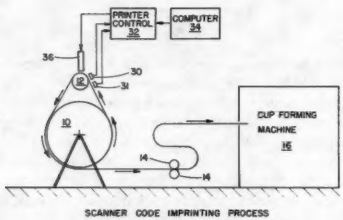
width with the external surfaces of the pulleys, said belt having an elastomeric material provided with a Shore-A hardness greater than 75 degrees and the bands of the belt placed laterally with respect to said holes embedding a reinforcing structure formed by a plurality of annular elements parallel to the longitudinal mid-plane of the belt and being constructed of a material having an elongation which is substantially less than that of the elastomeric material, whereby when during use movement is transmitted between the pulleys and the belt, the elastic strain of the lengths of the belt which are wound on the pulleys is rigorously always maintained in an arc-shaped circumference.

4,573,954

DIGITAL ENCODING AND ELECTRONIC SCANNING OF DRINK CUPS

Martin J. Berger, Dobbs Ferry, N.Y., and Sheldon P. Apsell, Newton, Mass., assignors to PepsiCo Inc., Purchase, N.Y.

Filed Sep. 4, 1984, Ser. No. 647,035
Int. Cl.[4] B31B *1/88*
U.S. Cl. 493—55 **13 Claims**



SCANNER CODE IMPRINTING PROCESS

1. A method of conducting an on-the-cup promotion by placing a machine-readable code on each cup, with the code indicating a promotion winner or not, comprising:

a. printing decorative indicia on cup blank stock prior to formation of individual cup blanks into cups in a cup forming machine;

b. printing a machine-readable code containing promotional prize information on each individual cup blank, in an automated controlled printing operation separate from said decorative printing operation, prior to formation of the blank into a cup in a cup forming machine;

c. forming the blanks into cups with a cup forming machine, subsequent to the machine-readable code printing operation;

d. scanning the machine-readable code on the cup at the point of sale of the cup to determine if the cup is a prize winner; and

e. indicating by a display at the point of sale whether or not the customer's cup is a prize winner.

4,573,955

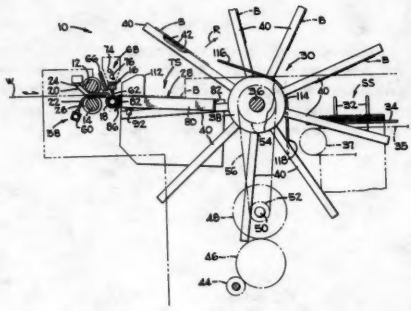
APPARATUS FOR STACKING THERMOPLASTIC SHEETS

Steven W. Mory, Green Bay, and Ronald L. Lotto, Bonduel, both of Wis., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 7, 1983, Ser. No. 539,789
Int. Cl.[4] B31B *1/64, 49/04;* B65H *29/32;* B65G *57/04*
U.S. Cl. 493—204 **1 Claim**

1. In an apparatus for processing thermoplastic web intermittently unwound from a web roll and provided with means for making equally spaced pairs of holes adjacent one edge of the web and means for sealing and severing equal increments of the web along a line transverse to the direction of web advance to thereby produce web segments of equal dimensions and each of which contain a pair of holes, said apparatus further including means for supporting the leading advanced web increment before and following severance, means for transferring and stacking the segment on pins projecting through the pair of holes;

the improvement in said apparatus comprising means operable during advance of the web for directing high velocity air streams in the direction of web advance and between the path of the web and said supporting means, and means for directing high velocity air streams derived from nozzles located below and adjacent the ends of the web segment parallel to the direction of web advance, said air streams having the combined effect to remove waviness or wrinkles from the web segment while it is deployed on the supporting means, means for directing high velocity air streams derived from a plurality of nozzles located above the path of the web and impinging the web at longitudinally spaced zones, said transfer means includes a



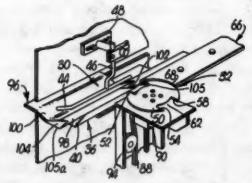
pair of transfer arm assemblies mounted on opposite ends of a transverse support shaft, each of said transverse arm assemblies including a plurality of radially extending circumferentially spaced hollow arms provided with holes communicating with a source of vacuum, means for rotating said arms in synchronism with the intermittent advance of the web with said arms describing paths straddling the supporting means to grasp successive web segments and transport the segment held thereby in a circular arc onto the pins, and means positioned between said transfer arm assemblies and adjacent said support shaft at a position spaced longitudinally downstream from the supporting means and said support shaft for deflecting the air currents created by said airstreams downwardly from the path in which the segments are transferred and placed on the pins.

4,573,956

SLITTER ASSEMBLY FOR DOUBLE FOLD BOTTOMER APPARATUS

Harold K. Johnson, Junction City, Kans., assignor to Mid America Machine Corp., Junction City, Kans.

Filed Sep. 8, 1983, Ser. No. 530,238
Int. Cl.[4] B21B *1/22*
U.S. Cl. 493—237 **14 Claims**



1. A slitter mechanism for slitting the defining walls of the

open end of an unfilled tube or the like, said mechanism comprising:

means for continuously moving said unfilled tube along a path of travel;

means adjacent said path of travel for separating at least certain portions of said end-defining walls of said continuously moving tube;

slitter means proximal to said separating means and including a pair of respective, spaced apart slitting edges; and

shifting means operably coupled with said slitter means for forming a pair of independent, spaced apart slits in said unfilled tube at respective spaced apart slitting locations while the tube is continuously moving along said path of travel, said shifting means including means for moving each of said slitting edges between said separated end-defining wall portions and into slitting engagement with the unfilled tube at a corresponding respective slitting location.

4,573,957

SYSTEM FOR THE TRANSPORT AND RAISING OF PACKING CONTAINER BLANKS

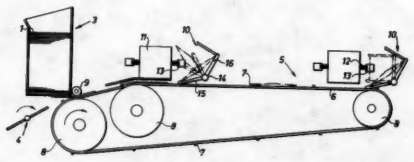
Alf Billberg, Oxie, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Feb. 24, 1984, Ser. No. 583,201

Claims priority, application Sweden, Mar. 1, 1983, 8301122

Int. Cl.⁴ B31B *1/78*

U.S. Cl. 493—309 **23 Claims**



1. A system for delivering unfolded packing containers from a source of flattened, tubular packing container blanks, said system comprising a feeding conveyor for conveying flattened blanks from said source along a conveyor path and a set of gripping elements at a fixed location spaced from said source along said conveyor path, said conveyor moving past said set of gripping elements said set of gripping elements including at least one primary gripping element, at least one secondary gripping element extending above said conveyor path and means for pivoting said primary gripping element about an axis transverse to and above said conveyor path between an inclined position relative to said conveyor path and a second position above said conveyor path, said primary gripping element at said inclined position extending below said conveyor path and defining a guide from the conveyor onto said secondary gripping element, said primary gripping element pivoting toward said secondary gripping element as said primary gripping element moves to said second position so to unfold the blank and to position the blank above said conveyor path.

17. A catching device suitable for catching folded container blanks being moved along a first conveyor path by a conveyor moving past said catching device and for raising each caught blank above said conveyor path in an unfolded state, said folded container blanks having a forward folded edge and a trailing folded edge, said catching device comprising:

a secondary arm defining a secondary catch above said conveyor path for receiving the forward folded edge, said secondary arm having surfaces leading to said secondary catch;

a primary arm pivotable about an axis transverse to and above said conveyor path from an inclined position to a raised position, said primary arm at said inclined position intercepting said conveyor path at an incline and defining a guide onto said secondary arm, said primary arm including a primary catch for receiving the trailing folded edge, said primary catch being positioned below said conveyor path when said primary arm is at said inclined position, said primary catch being positioned above said conveyor path when said primary arm is at said raised position so as to unfold said container blank in cooperation with said secondary catch; and

means for reciprocating said primary arm between said inclined and raised positions.

4,573,958

CUTTLING MACHINE FOR CONTINUOUS INPUT OF WEB

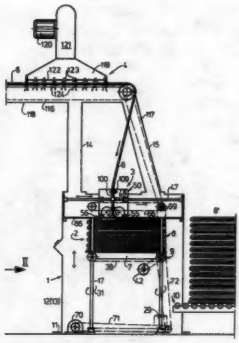
Peter J. Biesinger, Saumstr. 15, Herbertingen, Fed. Rep. of Germany (D-7944)

Filed Jul. 3, 1984, Ser. No. 627,871

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 8413894

Int. Cl.⁴ B31F *1/00*

U.S. Cl. 493—415 **11 Claims**



1. A machine for folding continuously supplied textile web in a stack comprising:

a frame;

a substantially horizontal stack support table;

means connected to said table for supporting said table for vertical stepwise movement downwardly and for the return of said table to an uppermost position;

a carriage movably mounted on said frame for reciprocating movement with respect to said frame and table parallel to the plane of said table;

carriage guide means mounted on said frame for supporting and guiding said carriage in said reciprocating movement;

a pair of web feeding bars rotatably mounted on said carriage directly adjacent the top of the stack in parallel spaced relationship with their axes of rotation parallel with respect to each other and perpendicular to the direction of reciprocation of said carriage;

two gear wheels rotatably mounted on said frame on opposite sides of said carriage;

an endless chain operatively engaging said two gear wheels to be driven thereby in a closed loop with the portions thereof between said gear wheels being parallel to the direction of reciprocation of said carriage;

a sliding member mounted on said chain;

a slide on said carriage extending perpendicular to said direction of reciprocation slidably engaging with said sliding member to form a sliding connection between said chain and carriage;

means to rotate one of said gear wheels for reciprocating said carriage on said carriage guide means at regular intervals on an unchanging horizontal path of travel so

that textile web fed through the space between said bars is deposited on said table in a folded manner;

means connected to said table supporting means for lowering said table in stepwise manner so that each lowering step commences at the end of each reciprocating stroke of said carriage and is equal to a whole number based on unity of thickness of the web being folded;

at least one rack mounted on said frame;

toothed wheel means operatively engaging said rack; and

freewheel means operatively connecting said toothed wheel means to said bars for driving said bars, so that reciprocation of said carriage causes said toothed wheel means in engagement with said rack through said freewheel means to rotate one of said bars in the feeding direction of rotation and the other of said bars to freewheel in one direction of reciprocation of said carriage, and the other of said bars to rotate in the feeding direction of rotation and said one bar to freewheel in the other direction of reciprocation of said carriage in continuous succession of alternate operations to produce said folding.

4,573,959

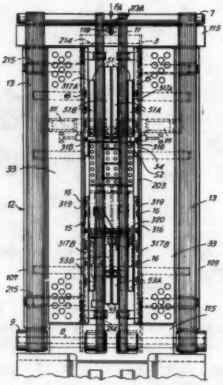
FABRIC FOLDING MACHINE

Renato Baccianti, Calenzano, Italy, assignor to Automa s.r.l. Costruzione Macchine Automatiche, Italy

Filed Jan. 10, 1983, Ser. No. 457,032

Int. Cl.[4] B31B *1/26;* **B65H** *45/00;* **A41H** *15/00*

U.S. Cl. 493—458 **9 Claims**



1. A machine for folding a fabric, comprising:

a structure **(1)** with a slide surface **(31,32)** for the fabric;

a multiple-belt conveyor **(12)** connected to said structure for feeding, halting and further feeding the fabric in a fabric feed direction (F_A), said conveyor having a plurality of belts with interspace therebetween;

suction apertures in said slide surface structure for retaining the fabric during folding operations;

two longitudinal plates **(33)** each hinged to said struture for rotation on an axis which is parallel to said fabric feed direction and positioned to receive the fabric in order to effect longitudinal folding of the fabric;

means connected to said longitudinal plate for rotating said longitudinal plates about said axis;

two comb-like blades **(51, 53)** mounted to said structure by hinges **(52,55)** having axes which are perpendicular to said fabric feed direction, said comb-like blades being turnable in opposite directions in order to effect transverse folding by acting in the interspaces between the conveyor belts;

means connected to said comb-like blades for turning said comb-like blades in opposite directions;

mounting means connected between at least one of said two comb-like blades **(53)** and said structures for displacement of said at least one comb-like blade into at least two positions in said feed direction to adjust for the length of the fabric to be folded in the feed direction;

suction means **(318,320)** connected to said structure and positioned to act along the hinges **(52,55)** of said comb-like blades to retain the fabric against said hinges; and

halting and positioning means **(118)** connected to said conveyor for halting said conveyor to stop the fabric at a selected position on said slide surfaces, said longitudinal blades and said comb-like blades.

4,573,960

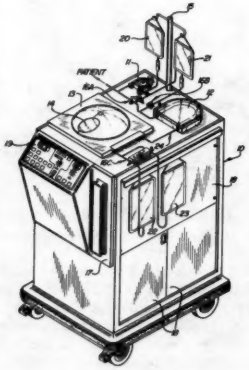
THREE PHASE IRRADIATION TREATMENT PROCESS

Jack Goss, Clearwater, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Oct. 29, 1984, Ser. No. 665,834

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—6 **6 Claims**



1. In a system for altering cells including treating the cells with a photoactivatable reagent and irradiating said cells and reagent whereby said reagent is caused to be activated and to affect said cells, a three phase method for so treating the blood of a patient comprising the steps of:

in a first phase,

collecting with a collection tubing set, whole blood from a patient having previously been given a pharmaceutically effective amount of a photoactivatable agent;

passing said whole blood into a continuous centrifuge for obtaining plasma and a leukocyte enriched portion;

storing a predetermined volume of said plasma and said leukocyte enriched portion;

returning nonleukocyte enriched portions and any excess plasma to said patient through said collection tubing set;

disconnecting said patient from said collection tubing set;

in a second phase,

passing said stored leukocyte enriched portion through an irradiation tubing set, including an irradiation chamber for photoactivating said reagent, until a predetermined level of photoactivation has been achieved; and

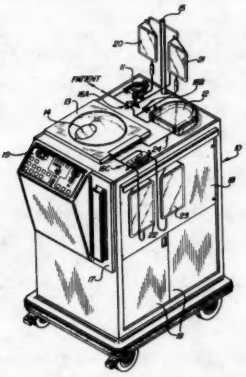
in a third phase,

returning said irradiated leukocyte enriched portion to said patient through a return tubing set.

4,573,961
ELECTRONIC CONTROL METHODS FOR PUVAPHERESIS APPARATUS

Martin J. King, Largo, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Oct. 29, 1984, Ser. No. 665,831
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—6 **4 Claims**



1. In an extracorporeal patient treatment system for the photoactivation of a reagent in contact with the patient's blood, said system including an anticoagulant infusion pump, a blood pump, a continuous centrifuge for obtaining various blood fractions, containers for receiving said fractions and for returning some fractions to the patient while other fractions are irradiated at an irradiation station, and sensors for generating signals in accordance with blood temperature, irradiation station cooling air flow and irradiation source current and voltage, a method for ensuring the safety of the patient undergoing treatment comprising:

monitoring the temperature of the blood fraction to be irradiated as it enters and as it exits the irradiation station;

further monitoring the flow of cooling air supplied to said irradiation station;

additionally monitoring the current and voltage supplied to the radiation source associated with said irradiation station;

wherein said monitoring is performed on an analog basis whereby said analog signals are individually compared to preset thresholds so that said treatment system may be entirely halted if any of said thresholds is exceeded while, simultaneously, said monitoring is also performed on a digital basis, said sensor signals being converted to a digital basis by analog to digital converter means to enable digital monitoring by a microprocessor in accordance with preprogrammed software criteria communicated to said microprocessor.

4,573,962
CASSETTE DRAWER ASSEMBLY FOR PHOTOACTIVATION PATIENT TREATMENT SYSTEM

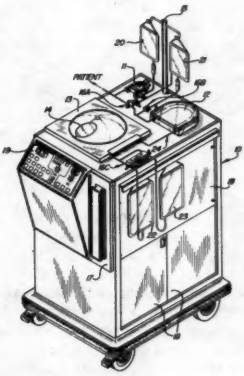
Vernon H. Troutner, St. Petersburg, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Oct. 29, 1984, Ser. No. 665,817
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—6 **5 Claims**

1. In a patient treatment system for extracorporeally irradiating blood from said patient to photoactivate a reagent in contact therewith and wherein said blood is circulated through a plurality of serially connected, cylindrical cavities having a radiation source centrally disposed therein forming a treatment cassette, an apparatus for use in said treatment system and for receiving said cassette comprising:

a container formed from front and back panels connecting top and bottom panels and adapted to receive said cassette;

means for supplying electrical power to said radiation source of said treatment cassette, said means for supplying electrical power having first power interconnect means mounted on said container for matably engaging second power interconnect means mounted on said patient treatment system;

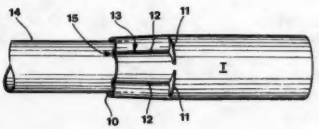


said container being movably mounted on tracks attached to said patient treatment system whereby said container must be moved to a first position to permit installation or removal of said cassette and where movement to said first position disengages said first power interconnect means from said second power interconnect means and wherein said container must be moved to a second position to engage said first and second means for supplying energy to activate said radiation source.

4,573,963
OUTER TAMPON TUBE WITH FINGER GRIP

Donald A. Sheldon, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 17, 1983, Ser. No. 542,853
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—15 **7 Claims**



6. An outer tampon tube comprising:

an elongated tubular element having a longitudinal axis and two ends, with an insertion portion at one end and a gripping portion at the other end,

said gripping portion having a plurality of spaced longitudinally extending inwardly turned ribs formed therein for engaging the outer surface of a tampon plunger element insertable within said gripping portion, said ribs being formed by a plurality of spaced slits extending generally around a circumference of said tubular element in the same general plane, and a plurality of longitudinal crease lines, a crease line extending from a respective slit and

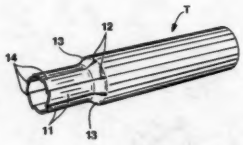
toward an end, said crease lines when indented radially inwardly on said tubular element forming said ribs.

4,573,964

OUTER TAMPON TUBE WITH RECESSED FINGER GRIP

Dawn M. Huffman, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 17, 1983, Ser. No. 542,864
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—15 10 Claims



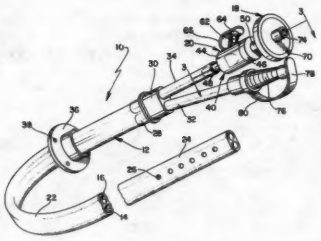
1. An elongated outer tampon tube formed from a single tubular element, said outer tampon tube having a longitudinal axis and two ends, with an insertion portion at one end and a gripping portion at the other end, said gripping portion being recessed with an outside diameter that is smaller than the outside diameter of said insertion portion, said recessed gripping portion being comprised of a plurality of overlapped elongated sections formed on said single tubular element by a plurality of slits through said tubular element, said slits being spaced around the circumference of said tubular element and extending generally longitudinally along said tubular element from the gripping portion end to a point spaced inwardly from that end.

4,573,965

DEVICE FOR DRAINING WOUNDS

Ronald D. Russo, Barrington, R.I., assignor to Superior Plastic Products Corp., Cumberland, R.I.

Filed Feb. 13, 1984, Ser. No. 580,091
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—30 5 Claims



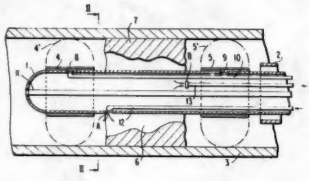
1. A device for draining wounds and the like comprising:
(a) a catheter member having distal and proximal ends and having first and second longitudinally extending lumens therethrough;
(b) an antibacteria filter mounted in in-line communication with said second lumen for filtering gases passing therethrough; and
(c) a check valve element mounted in in-line communication with said second lumen and with said filter so that gases can flow through said filter and through said second lumen toward said second lumen distal end but so that fluids from a wound adjacent said second lumen distal end are prevented from flowing back through said second lumen and into said filter, whereby blockage of said filter as a result of backflow of said fluids is prevented.

4,573,966

METHOD AND APPARATUS FOR REMOVING AND/OR ENLARGING CONSTRICTED AREAS IN VESSELS CONDUCTING BODY FLUIDS

Andreas Weikl, and Volkmar Merkel, both of Erlangen, Fed. Rep. of Germany, assignors to Schneider Medintag AG, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,464
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146459; Sep. 29, 1982, 3235974
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—53 40 Claims



1. An apparatus, adapted for use with means for supplying a dissolving fluid to an isolated area in a vascular passageway, of a size to fit within a vascular passageway conducting body fluids, such as arteries and veins conducting blood, for selectively isolating constricted areas in the vascular passageway, such as stenosis, and treating the isolated area with the dissolving fluid, the apparatus comprising a flexible treatment catheter, two balloon means disposed near the end of the flexible catheter, each of the two balloon means being expandable by a pressure medium so as to contact the inside of the passageway and being controllable from outside the catheter, the two balloon means being disposed one after the other at such a distance that one balloon means is adapted to be placed ahead of and the other behind the constricted area, the two balloon means being expandable for operatively sealing off and thereby isolating the constricted area, at least two partition walls extending substantially the full length of the catheter subdividing the catheter into at least four channel means, opening means in said catheter connecting two of the at least four channel means to the area isolated by the two balloon means, whereby dissolving fluid for treatment of the isolated area can be supplied to the isolated area through one of the opening means from outside the catheter and removed from the isolated area through another of said opening means.

4,573,967

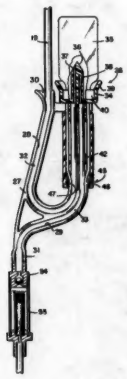
VACUUM VIAL INFUSION SYSTEM

William W. Hargrove, Indianapolis; Dale C. Harris, Fairland; Michael J. Akers, Greenwood, all of Ind., and Charles R. Sperry, Westport, Conn., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 6, 1983, Ser. No. 558,060
Int. Cl.[4] A61W *5/00*
U.S. Cl. 604—56 9 Claims

1. In an intravenous administration set comprising a container containing a fluid, a delivery tube connected to the container for dispensing fluid therefrom, injection means for connecting the delivery tube to a patient, a drip chamber situated in the delivery tube for permitting the determination of the administration rate of the fluid, and control means for controlling the administration rate of the fluid, the improvement comprising: a vial containing a medicine under a partial vacuum, penetrating means penetrating an end of the vial to provide two pathways to the interior of the vial, two adjacent sections of the delivery tube being arranged contiguous to each

other and connected to the two pathways of the penetrating means, fluid flow restricting means situated in the delivery tube between the injection means and the penetrating means for permitting fluid flow into the vial only from said container, and



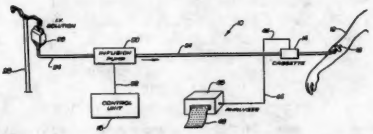
means embracing said adjacent sections of the delivery tube for releasably closing both pathways to the interior of the vial to temporarily prevent flow of fluid through the penetrating means.

4,573,968

INFUSION AND BLOOD CHEMISTRY MONITORING SYSTEM

Kenneth B. Parker, Alpine, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Aug. 16, 1983, Ser. No. 523,733
Int. Cl.[4] A61B 5/00
U.S. Cl. 604—67 **16 Claims**



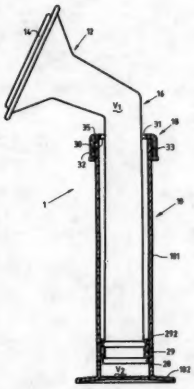
1. A system for infusing fluid into a patient and for monitoring patient blood chemistry, comprising:
an infusion line;
a catheter at one end of said infusion line and adapted for insertion into the patient;
a reversible infusion pump operable for pumping an infusion fluid through said infusion line and said catheter in a first direction for infusion into the patient;
a blood chemistry sensor mounted in flow communication with said infusion line near said catheter for providing an indication of patient blood chemistry upon contact with a patient blood sample; and
control means for controllably interrupting operation of said infusion pump in said first direction to interrupt supply of infusion fluid into the patient for a selected time interval;
said control means further including means for operating said infusing pump for pumping infusion fluid through said infusion line in a second direction for drawing a patient blood sample through said catheter into contact with said sensor and then to resume operation in said first direction for reinforcing the drawn blood sample through said catheter into the patient followed by resumed infusion of said infusion fluid.

4,573,969

BREAST PUMP

Klaus Schlensog, Cham; Christian Beer, Boniswil, and Robert Riedweg, Lucerne, all of Switzerland, assignors to Ameda AG, Zug, Switzerland

Filed Jan. 3, 1984, Ser. No. 567,891
Claims priority, application Switzerland, Jan. 11, 1983, 122/83
Int. Cl.[4] A61M 1/06
U.S. Cl. 604—74 **9 Claims**



1. In a breast pump comprising:
an elongated outer cylinder means having a first or lower closed end and a second or upper open end;
a hollow piston means having
a suction bell portion for putting against a mother's breast to surround a teat,
an elongated tubular portion integrally connected at its first or upper end with said suction bell portion and having a second or lower open end, and
a resilient annular sealing means mounted at the outer side of the tubular portion near said lower end thereof;
said elongated tubular portion being inserted into said outer cylinder means for reciprocating displacement relative to said cylinder means in a substantially axial direction so as to move said closed lower end of said cylinder means to-and-fro relative to said open lower end of said tubular portion; and
said sealing means cooperating with said outer cylinder means to generate a suction effect upon said fro movement;
the improvement consisting substantially of: said elongated tubular portion being tapered substantially over the entire length thereof so that its outer diameter at its upper end is smaller than its outer diameter at its lower end for permitting limited tilting of the longitudinal axis of said outer cylinder means relative to the longitudinal axis of said elongated tubular portion, and said suction bell portion being arranged at predetermined angle α of from about 30° to about 90° with respect to the position of the longitudinal axis of said suction bell portion in relation to the longitudinal axis of said tubular portion for permitting the outer cylinder to be held more nearly vertical when said pump is operated to extract milk from the breast of a person whose thorax is in a substantially vertical or upright position.

4,573,970

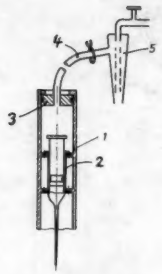
SUCTION INJECTOR

Wolfgang Wagner, Exerzierstr. 1, Berlin 65, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 241,378, Feb. 26, 1981, Pat. No. 4,393,870, which is a continuation-in-part of Ser. No. 93,615, Nov. 9, 1979, Pat. No. 4,284,077, which is a division of Ser. No. 933,136, Aug. 14, 1978, abandoned, and a continuation-in-part of Ser. No. 793,951, May 5, 1977, Pat. No. 4,114,691, which is a continuation-in-part of Ser. No. 634,741, Nov. 21, 1975, abandoned. This application Aug. 6, 1982, Ser. No. 405,560

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—115 22 Claims



1. A suction injector, particularly for use with hypodermic injections, comprising:

a tubular housing;

partitioning means, slidably disposed in the housing and frictionally sealed against the housing, thereby dividing the housing into two chambers of oppositely varying volume;

supporting means in one of the chambers of the housing, on one side of said partitioning means, for supporting a container filled with medicine and constructed to be operated by volume reduction in said chamber and having a cannula for ejecting the medicine in the container;

suction cup means at one end of the housing, being at the same side of said partitioning means as said supporting means;

means for applying a vaccum to said one chamber at said same side of the partitioning means to be effective also at the suction cup, so that skin forced into the suction cup thereby being penetrated by the cannula; and

due to said friction, said partitioning means delayedly sliding exclusively on account of the established vacuum in said one chamber towards the container for operating the same through reduction in volume of said chamber in order to obtain ejection of medicine through the cannula.

4,573,971

AUTOMATIC INJECTION DEVICE

Paulus R. Kamstra, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

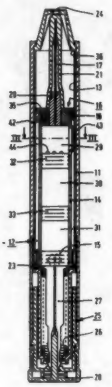
Continuation-in-part of Ser. No. 405,367, Aug. 5, 1982, Pat. No. 4,529,403. This application Dec. 13, 1983, Ser. No. 560,925

Claims priority, application Netherlands, Aug. 10, 1981, 8103744

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—191 12 Claims

1. An automatic device for injecting two or more different injection liquids which may not be in contact with each other for long periods of time, comprising a combination of a discharge mechanism, a cartridge holder and a cartridge which is slidably accommodated in the holder and which comprises an ampoule, a piston which is movable in the ampoule and seals same, and a hypodermic needle connected to the front of the ampoule by means of a needle mount, and, if desired, covered by a flexible sheath to maintain the needle in a sterile condition, said device being characterized in (a) that said cartridge includes said injection liquids and the ampoule between the piston and the needle mount comprises one or more stoppers which are movable in the ampoule and which, before use of the device, keep the injection liquids present in the ampoule separated from each other in that their circumference adjoins the inner wall of the ampoule in a sealing manner, (b) that said cartridge includes means maintaining most of the peripheral area of said ampoule in radially spaced relationship from said holder, (c) that the needle mount comprises a neck connected



to the front of said ampoule in which the injection needle is sealingly connected, (d) that the rear face of the neck of the needle mount or the front face of the stopper nearest to the rear face of the neck of the needle mount comprises a plurality of spacing supports, and (e) that the inner wall of the ampoule is locally deformed between the needle mount and the stopper or foremost stopper over a length which is slightly larger than the length of the stopper or the collected stoppers in such a manner that upon actuation of the device a bypass is formed, allowing the injection liquid or liquids behind the stopper or stoppers to reach the needle past the stopper or stoppers.

4,573,972

AUTOMATIC INJECTION DEVICE

Paulus R. Kamstra, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Continuation-in-part of Ser. No. 405,367, Aug. 5, 1982, Pat. No. 4,529,403. This application Dec. 13, 1983, Ser. No. 560,935

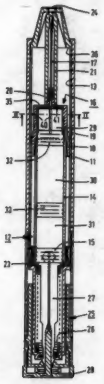
Claims priority, application Netherlands, Aug. 10, 1981, 8103744

Int. Cl.[4] A61M *5/08*

U.S. Cl. 604—191 10 Claims

1. An automatic device for injecting two or more different injection liquids which may not be in contact with each other for long periods of time, comprising a combination of a discharge mechanism, a cartridge holder and a cartridge which is slidably accommodated in the holder and which comprises an ampoule, a piston which is movable in the ampoule and seals same, and a hypodermic needle connected to the front of the ampoule by means of a needle mount, and, if desired, covered by a flexible sheath to maintain the needle in a sterile condition, said device being characterized in that said cartridge includes said injection liquids and the ampoule between the piston and the needle mount comprises one or more stoppers which are movable in the ampoule and which, before use of the device, keep the injection liquids present in the ampoule separated from each other in that their circumference adjoins the inner wall of the ampoule in a sealing manner, and that the needle mount comprises a collar connected to the front of the am-

poule in a sealing manner, a neck in which the injection needle is connected, and an entirely or substantially cylindrical shaft between the collar and the neck, a passage being formed in the inner wall of the shaft and the rear face of the neck past which the injection liquid or injection liquids can reach the needle when during use of the device the stopper or stoppers is or are moved into the shaft of the needle mount; the inner wall of the shaft of the needle mount having a circular or oval cross-section, the rear face of the neck of the needle mount comprising



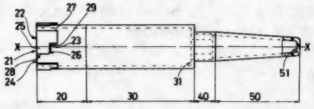
a plurality of spacing supports; and the region bounded by the inner wall of the shaft and the spacing supports on the rear face of the neck having a slightly larger circumference than the expanded stopper or stoppers and being slightly longer than the stopper or the collective stoppers, so that the stopper or the collective stoppers in the extreme forward position can fill this region substantially entirely but in which an aperture remains around the stopper or stoppers; and said collar including means for maintaining the ampoule in radially spaced relationship from said holder.

4,573,973

CASE FOR PROTECTING A SYRINGE BODY

Michel A. Mezi, Quetigny, France, assignor to Laboratoire Spad, Quetigny, France

Filed Aug. 16, 1984, Ser. No. 641,487
Claims priority, application France, Sep. 2, 1983, 83 14563
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—197 **5 Claims**



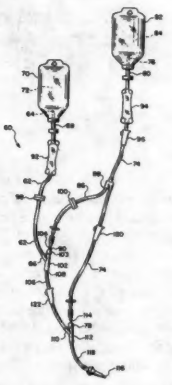
1. Case for protecting a syringe body constituted by a hollow tubular member which fits tightly on the outer face of the body, one end of this member being closed off by a solid wall, the length of the case being such that when the body is introduced into the latter, the tip for fixing the syringe on a gripping tool remains exposed and the needle which projects outside the body is protected in an air-tight manner, inside the case, without contact with the inner faces of the latter, the case being provided internally with an abutment which limits the penetration of the syringe body in the case so that the needle does not reach the closing wall, the open end of the case being closed by a removable blind cap having an inner diameter corresponding to the outer diameter of said end of the case so that this cap constitutes a virtually air-tight closure enclosing and protecting the syringe body in the case, characterised by the fact that its open end comprises, also distributed on the outer periphery of the case along equidistant generatrices parallel to the axis of symmetry of the case, parts in relief of identical thickness, in the form of angle members whereof one side namely the side which is oriented towards the opening of the case, is situated on a single circumference parallel to the rim of said opening, the apex of each internal rightangle being situated on another single circumference which is parallel to the former and by the fact that the cap comprises, also distributed on its inner periphery in contact with the case along equidistant generatrices, parallel to its axis of symmetry, parts in relief of identical thickness, in the form of rectangles whereof the same side, directed towards the opening in the cap, is situated on a single circumference parallel to the rim of the opening in the cap, the peripheral spacing between the rectangles corresponding to the peripheral spacing between the sides of the angle members parallel to the axis of symmetry common to the case and to the cap, so that positioning of the cap on the case introduces the rectangles between the angle members and that a rotation of the cap with respect to the case places these rectangles in the rightangles of the angle members all orientated in the same direction in order to ensure locking of the cap on the case.

4,573,974

MEDICAL ADMINISTRATION SET ENABLING SEQUENTIAL DELIVERY OF TWO LIQUIDS AT DIFFERENT FLOW RATE

Rick Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 445,872, Dec. 1, 1982, abandoned. This application Apr. 25, 1985, Ser. No. 726,928
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—81 **12 Claims**



1. A medical liquid administration set for the sequential administration of two medical liquid sources, which can be delivered at different liquid flow rates without readjustment of the set, the administration set comprising:

(a) a first conduit including a proximal end for connection to a first liquid sources, and a distal end;

(b) a second conduit including a proximal end for connection to a second liquid source, and a distal end, said second conduit being devoid of any gas barrier means;

(c) a cross over branch having an upstream end in communication with said second conduit between said proximal and distal ends of said second conduit, and a downstream end in communication with said first conduit at said distal end of said first conduit, said cross over branch being devoid of any gas barrier means;

(d) a common conduit including a proximal end in communication with both said distal end of said first conduit and said downstream end of said cross over branch, and further including a common conduit distal end, said common conduit distal end being in communication with said second conduit at said second conduit distal end, said common conduit being devoid of any gas barrier means;

(e) a liquid outlet located no greater than about four inches downstream of distal ends of both said common conduit and said second conduit, there being no gas barrier means between said distal ends of both said common conduit and said second conduit and said liquid outlet;

(f) a one-way valve in said cross over branch permitting liquid flow only in the direction from said upstream end to said downstream end;

(g) a one-way valve in said first conduit permitting liquid flow only in the direction from said first conduit proximal end to said first conduit distal end;

(h) adjustable liquid delivery rate control means on said second conduit, downstream of said upstream end;

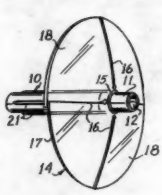
(i) whereby in operation said distal ends of said common conduit and said second conduit are disposed at an elevation lower than, equal to or not substantially higher than said liquid outlet.

4,573,975

PROTECTIVE SHIELD FOR NEEDLE RECEIVER

Brian S. Frist, 65 Cameron Glen Dr., Atlanta, Ga. 30328, and Wayne H. Lazarus, 50 Bransford Rd., Atlanta, Ga. 30342

Filed Jan. 4, 1985, Ser. No. 688,734
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **8 Claims**



1. A protective shield, for a needle receiver comprising a container for a hypodermic needle, said container having an open top for receiving said needle, and a neck portion adjacent to said open top, said protective shield including a piece of sheet material defining a central opening therethrough, said central opening being adapted to receive said neck portion of said container, said piece of sheet material having a periphery, and means for allowing said protective shield to fold whereby said periphery is effectively shortened and said sheet of material assumes a generally conical shape, a washer carried on said container adjacent to said neck for limiting the motion of said protective shield in one direction, and a retainer carried on said neck for holding said protective shield against said washer.

4,573,976

SHIELDED NEEDLE

Norma A. Sampson, Fullerton, and Earl W. Sampson, Ontario, both of Calif., assignors to Dolores A. Smith, Fullerton, Calif., a part interest

Filed May 24, 1984, Ser. No. 613,460
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—198 **14 Claims**

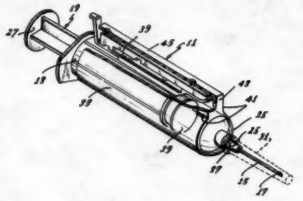
1. An apparatus for injecting a substance into a human or an animal comprising:

a body adapted to have the substance to be injected pass therethrough;

means for mounting a needle on the body with the needle having a passage extending therethrough and terminating in a point whereby the substance can pass from the body to and through the passage of the needle;

a removable shield covering said needle;

a needle guard having open opposite ends movable on the body between an extending position in which the guard obstructs access to the point of the needle and a retracted position in which the guard does not materially obstruct access to the point of the needle and in which the needle



and shield project through one of said open ends of said needle guard, said extended and retracted positions being axially spaced;

means for releasably retaining the guard in the retracted position; and

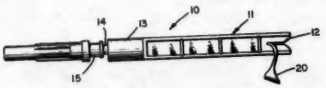
means on the body and the guard for resisting movement of the guard from the extended position back toward the retracted position.

4,573,977

BLADDER-TYPE SYRINGE

A. Gerrit Crawford, 6223 Bakman St., North Hollywood, Calif. 91606

Filed Feb. 27, 1984, Ser. No. 583,775
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—212 **4 Claims**



1. A bladder-type syringe which the user employs to collect blood samples, said bladder-type syringe comprising:

a. an elongated bladder which is formed out of a high gas-diffusion barrier film and which has an open end and a closed end with said elongated bladder having longitudinal convolusions whereby the amount of gas contained within said elongated bladder is minimized so that when said elongated bladder is filled with the blood sample there is a minimal amount of air trapped therewithin;

b. a hypodermic needle which has a sharp distal end with and a blunt proximal end and which a user employs to penetrate into a blood vessel;

c. bladder coupling means for fixedly, but detachably, and fluidly coupling said elongated bladder at its said open end to said hypodermic needle at its said blunt proximal end extending into said coupling means in order to reduce dead-spaces in said coupling means; and

d. an elongated member which has a first end and a second end and which has a flat surface with a keeper slot at its said first end, said elongated bladdder being fixedly, but detachably, coupled to said keeper slot whereby the user is able to support said elongated bladder and isolate any air bubbles contained in said elongated bladder and said bladder coupling means being mechanically coupled to said elongated member at its said second end whereby said elongated bladder is suspended above said flat surface of said elongated member and whereby when said elongated bladder is filled with a blood sample the user removes the blood sample by pressing

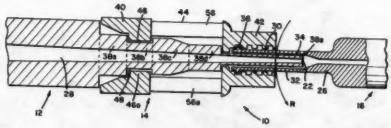
said elongated bladder between his thumb and said flat surface of said elongated member.

4,573,978

ANGIOGRAPHIC SYRINGE AND CONNECTOR FOR JOINING A CATHETER THERETO

David M. Reilly, Glenshaw, Pa., assignor to Medrad, Inc., Pittsburgh, Pa.

Filed Mar. 15, 1984, Ser. No. 680,407
Int. Cl.[4] A61M 5/325
U.S. Cl. 604—240 **17 Claims**



1. A syringe assembly for introducing fluids into the body of an animal and connectable with a catheter, said assembly comprising:

a syringe having a tubular body with an outwardly extending flange at one end, a piston slidably positioned in said body, a discharge extension, an intermediate portion connecting said tubular body and said discharge extension, said discharge extension including engagement means for engaging a connector thereto, and an outlet from said discharge extension;

a connector comprising a hollow tubular body having a first and second end and an intermediate portion defining the axial spacing between said first and second ends, said connector including first attachment means positioned internally on said first end and disposed for engaging said discharge extension engagement means, and second attachment means positioned internally on said second end and disposed for engaging said catheter; and

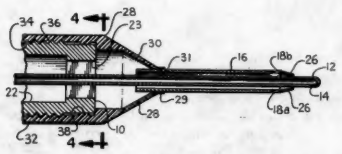
said first attachment means designed to rotatably engage said discharge extension engagement means so as to permit purely rotational movement of said connector about said discharge extension and preclude translational movement thereon.

4,573,979

IRRIGATION/ASPIRATION TIP

Larry W. Blake, Irvine, Calif., assignor to Innovative Surgical Products, Inc., Santa Ana, Calif.

Filed Aug. 23, 1984, Ser. No. 644,057
Int. Cl.[4] A61M 5/325
U.S. Cl. 604—240 **15 Claims**



1. A device for use on a surgical irrigation/aspiration instrument, comprising:

a cannula having first and second ends, said cannula having a first aperture adjacent said first end for communicating with a portion of the body, and having a second aperture adjacent said second end for communicating with said surgical instrument; and

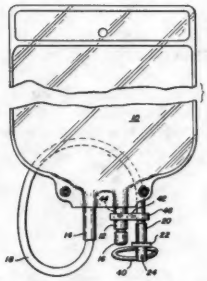
a flexible support connecting said second aperture of said cannula to said surgical instrument so as to provide a fluid tight connection, said flexible support forming a flexible joint adjacent said second cannula, said flexible support being made of a more flexible material than said cannula so as to allow said cannula to rotate about said support without the need to deform said cannula to cause said rotation.

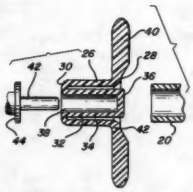
4,573,980

PORT PROTECTOR

Frank Karrasch, Wadsworth, and John F. Love, Palatine, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 533,076, Sep. 19, 1983, abandoned. This application Jun. 27, 1985, Ser. No. 750,048
Int. Cl.[4] A61M 5/005
U.S. Cl. 604—256 **1 Claim**





1. A port protector for closing the end of a tubular port, the port having an interior with an inner diameter and an exterior with an outer diameter, said port protector comprising

means defining an elastic inner tubular member which, when unstretched, has a normal outer diameter which exceeds the inner diameter of the port, said inner tubular member being stretchable to reduce its normal outer diamter, said inner tubular member including an interior bore having a closed end and an axially opposite end which is open for accommodating within said interior bore the insertion of a push rod to press against said closed bore end to insert said inner tubular member into the interior of the port by stretching said inner tubular member to reduce said normal outer diameter, said elastic inner tubular member relaxing, upon removal of the push rod from said bore, to return toward said normal outer diameter, thereby sealingly occupying the interior of the port,

means defining an elastic outer tubular member joined to said inner tubular member at a junction adjacent to said open end of said inner tubular member bore, said outer tubular member being normally folded back at said junction to peripherally surround said inner tubular member, said outer tubular member, when folded, having a normal, unstretched interior diameter greater than said normal outer diameter of said inner tubular member and less than the outer diameter of the port so that, when said inner tubular member sealingly occupies the interior of the port,

said outer tubular member sealingly surrounds the exterior of the port, and

means defining a handle joined to said outer tubular member at a point spaced away from said junction between said inner and outer tubular members, said handle being joined at said point at radially opposite portions of said outer tubular member, said handle being operative, in response to a pulling force applied along the axis of the port, for first peeling said elastic outer tubular member away from the exterior of the port until said junction between said inner and outer tubular members is reached and, in response to a continuation of said pulling force, for pulling said inner tubular member out of the interior of the port.

4,573,981

PROTECTIVE SHEATH STRUCTURE FOR A CATHETER ASSEMBLY

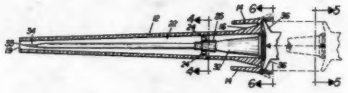
Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Oct. 24, 1983, Ser. No. 544,464

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—263 **11 Claims**



1. A sheath structure of the type positioned in substantially enclosing, protective relation to a catheter assembly comprising:

(a) said sheath structure including a body means having a substantially elongated configuration of a predetermined length sufficient to extend beyond the catheter assembly portion being enclosed,

(b) entrance means including an opening formed at one end of the body means and dimensioned to allow passage of the enclosed catheter assembly portion therethrough,

(c) locking means integrally formed on said body means adjacent said entrance means and structured to selectively engage and disengage a flange structure formed on the catheter assembly,

(d) said locking means comprising two finger elements each pivotally connected on opposite sides of the body means and including a lever portion spaced from said body means and extending in substantially parallel relation to the other of said finger elements and away from said entrance means,

(e) each finger element further including a gripping portion integrally secured to said lever portion and extending colinear therewith in the opposite direction, said gripping portion structured to lockingly engage the flange structure of the catheter assembly,

(f) said flange structure comprising two flange elements extending outwardly from opposite sides of a catheter base of said catheter assembly, each flange element configured for grasping engagement by one of said finger elements,

(g) guide means disposed adjacent said locking means and structured to orient said flange elements into communicating relation with said locking means,

(h) whereby said sheath structure may be selectively secured to and removed from enclosing relation to said catheter assembly.

4,573,982

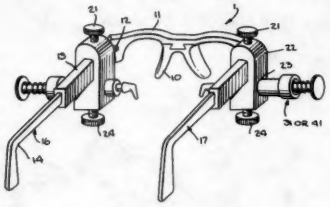
EYE FRAME OPHTHALMIC DRUG DELIVERY DEVICE

Alexander E. Forbes, and John L. Haslam, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 10, 1983, Ser. No. 550,427

Int. Cl.[4] A61M *35/00*

U.S. Cl. 604—300 **6 Claims**



1. A universally adjustable ophthalmic drug delivery device comprising: (a) a bridge having an adjustable nose piece thereon; (b) temples hingedly mounted at the ends of the bridge piece for securing said device to a patient's ears; (c) a pair of blocks slidably mounted on the channel portion of said temples; (d) a pair of syringes slidably mounted, perpendicular to the longitudinal axis of said temples, on said blocks said syringe ends terminating in the vicinity of the patient's eye such that the block and syringe are so adjusted to fit and deliver a dose of ophthalmic medicament to the lower cul-de-sac of the patient's eye.

4,573,983

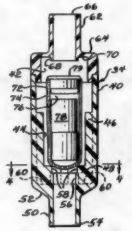
LIQUID COLLECTION SYSTEM HAVING AN ANTI-SEPTIC MEMBER ON THE DISCHARGE SECTION

Larry D. Annis, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 27, 1984, Ser. No. 635,017

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—322 **6 Claims**



1. A urine drainage collection system, comprising:

a drainage container having a chamber for collection of liquid therein;

a flexible tubular discharge section having an outer end in fluid communication with a lower portion of said chamber for discharge of collected urine;

a clamp on said tubular section for releasably opening and closing the tubular section; and

a tubular anti-septic device means containing an antiseptic capsule in fluid communication with the outer end of the tubular discharge section, said device having an annular wall and inner and outer sections forming a cavity to contain said antiseptic capsule, base portion means at the outer end of said tubular device means forming at least one well portion, said well portion acting to trap minor portions of urine when urine is discharged from said container

chamber, a pocket means formed by projections at the inner section of the tubular device to act as a barrier trap against the passage of urine back to the collection bag when the antiseptic device and the flexible tubular discharge section are inverted from a discharge condition to a storage condition.

4,573,984

WASTE RETAINING RECEPTACLES FOR PATIENTS WITH COLOSTOMIES AND ILEOSTOMIES

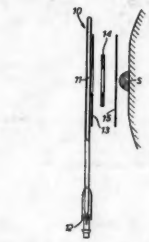
George Y. Benzies, 47, The Riding, Woking, Surrey, England (GU215TA)

Filed Sep. 14, 1983, Ser. No. 532,711

Claims priority, application United Kingdom, Dec. 11, 1982, 8235367

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—339 **8 Claims**



1. A waste retaining receptacle for adhering to the body of a user to collect body waste issuing from the user's body via a stoma or similar orifice, said receptacle including an inlet aperture for waste, seal means surrounding said aperture for sealingly being adhered to the user's body around the stoma, said seal means comprising two laminae of relatively thin material bonded one to each side of a flexible annular ring resiliently deformable non-viscous material having a thickness substantially greater than the thickness of said laminae, one of the laminae being attached to the receptacle around said inlet aperture, and the other lamina being adapted to be adhered to the user's body around the stoma, said laminae extending each a substantial distance beyond the periphery of said flexible ring and bonded to one another over a substantial surface area at least around a major portion of the periphery of said flexible ring sheet.

4,573,985

URINARY COLLECTION METHOD AND DEVICE

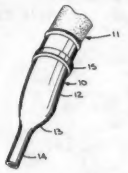
Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corp., Racine, Wis.

Continuation-in-part of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and a continuation-in-part of Ser. No. 266,455, May 22, 1981, abandoned, and a continuation-in-part of Ser. No. 328,827, Dec. 9, 1981, Pat. No. 4,411,261, and a continuation-in-part of Ser. No. 478,449, Mar. 24, 1983, Pat. No. 4,532,920. This application Jan. 6, 1984, Ser. No. 568,745

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—349 **2 Claims**

1. A method of modifying the penis of an incontinent patient so that an elastic sheath of a urinary collection device can be securely retained thereon, which method comprises making an incision in the penis, implanting into each of the corpora cavernosa of the penis a generally cylindrical penile implant having an expansible inflatable chamber and a self sealing means for filling such chamber, closing the incision, periodically injecting fluid into said chamber through said self sealing means via a cannula to stretch and expand the chamber and the penis until



the penis is large enough and firm enough to securely retain the elastic sheath of a urinary collection device but still flexible enough to bend without discomfort to the patient and then placing an elastic urinary collection sheath upon the thus modified penis.

4,573,986

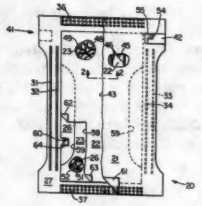
DISPOSABLE WASTE-CONTAINMENT GARMENT

James A. Minetola, Cincinnati, and David R. Tucker, Mason, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 17, 1984, Ser. No. 651,374

Int. Cl.[4] A61F *13/18*

U.S. Cl. 604—366 **32 Claims**



1. A disposable waste-containment garment comprising an absorbent core, a liquid permeable lamina, and a liquid impermeable backsheet, said absorbent core comprising a mass of fibers substantially devoid of interfiber bonds, said absorbent core being disposed intermediate said lamina and said backsheet, and adhesively secured in face to face relation to said lamina with an open pattern of adhesive having an average weight of from about eight-tenths to about four-and-seven-tenths grams per square meter.

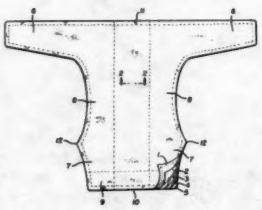
26. A disposable waste-containment garment comprising an absorbent core, a liquid permeable lamina, and a liquid impermeable backsheet, said absorbent core comprising a mass of fibers substantially devoid of interfiber bonds, said absorbent core being disposed intermediate said lamina and said backsheet, and adhesively secured in face to face relation to said lamina with a reticulated network of filaments of hot melt adhesive.

4,573,987

REUSABLE MULTI-LAYERED DIAPER WITH WICKING ACTION

Kenneth A. Lamb, Jr., Miami, Fla., assignor to KW Marketing Incorporated, Miami Lakes, Fla.

Filed Mar. 27, 1985, Ser. No. 716,683
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 **3 Claims**



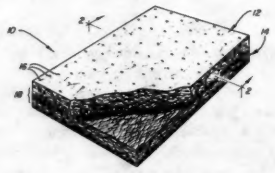
1. A multi-layer reusable, washable diaper for use in contact with the skin comprising:
- a 100% natural cotton first layer for contacting the skin;
- a hydrophobic contiguous second layer having a synthetic bonded monofilament construction providing a wicking action for drawing moisture away from the skin;
- a highly absorbent cotton third layer;
- a highly absorbent combination cotton and synthetic bonded monofilament terrycloth fourth layer;
- a highly absorbent combination cotton and synthetic bonded monofilament terrycloth outer fifth layer;
- said diaper providing a breathable air vapor porous characteristic at normal atmospheric pressure throughout the combination of all layers of the diaper;
- all layers of said diaper constructed with substantially the same resistance to machine washing and drying.

4,573,988

SUPERTHIN ABSORBENT PRODUCT

Heinz A. Pieniak, North Brunswick, and Michael J. Iskra, Flemington, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 505,579, Jun. 20, 1983, which is a continuation-in-part of Ser. No. 439,963, Nov. 8, 1982, Pat. No. 4,500,315. This application May 7, 1984, Ser. No. 607,379
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—379 **37 Claims**



1. A disposable absorbent compressed composite comprising a first layer, a second layer, and a transition zone integrally and intimately connecting said first and second layers, said first layer comprising a fibrous web having a dry bulk recovery of at least about 30 percent, an initial dry bulk of at least about 40 cc/gm, a wet bulk of at least about 30 cc/gm and a weight less than about 4 oz/yd^2, and a plurality of particles of superabsorbent material disposed intermittently throughout said first layer, said superabsorbent particles being present in at least about 200 percent dry-add-on basis, said second layer comprising substantially uniformly disposed, hydrophilic particles selected from the group consisting of cellulosic fibers, peat moss, rayon fibers, acrylic fibers, and mixtures thereof, said particles being sufficiently closely spaced to adjacent particles to promote rapid movement of liquid along the plane of said layer, and said transition zone comprising portions of said hydrophilic particles extending into and becoming integral with said first layer with portions of said hydrophilic particles in intimate contact with said superabsorbent material, said composite being compressed substantially reduce its thickness.

4,573,989

DISPOSABLE DIAPER AND METHOD OF MANUFACTURE

Hamzeh Karami, Embourg, and Myriam Delvaux, Hannut, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,364
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—381 **3 Claims**

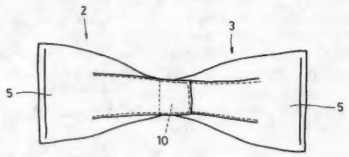
1. A disposable diaper comprising an absorbent pad positioned between a top sheet and a waterproof backing sheet, said absorbent pad being characterized by the absence of wadding sheets to improve suppleness of said diaper, and a liquid binder sprayed on said backing sheet between said absorbent pad and said backing sheet to stabilize said pad to said backing sheet.

4,573,990

DISPOSABLE DIAPERS

Hiroaki Ohsaki, Nagoya, Japan, assignor to Ohsaki Eisei Zairyo K.K., Nagoya, Japan

Filed Nov. 20, 1984, Ser. No. 673,350
Claims priority, application Japan, Nov. 24, 1983, 58-222895
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **2 Claims**



1. A disposable diaper comprising a web of layered material including a water absorbent, non-woven top sheet, a waterproof backing sheet bonded to said top sheet at their peripheral margins to form a generally rectangular bag having longitudinal and transverse edges, and at least one layered middle pad encased in said bag, and extending over substantially the entire area of said bag;
- said web having a front portion serving as a front diapering area applicable to the abdomen of a human body, a rear portion serving as a diapering area applicable to the buttocks of a human body, and a medial portion therebetween;
- said web, with said top sheet facing up, being folded along its longitudinal center line into a generally inverted Ω-shaped vertical cross sectional configuration, and subsequently

being folded intermediate the transverse edges of said bag and along the transverse edges of said medial portion into a generally S-shaped vertical cross-sectional configuration,

wherein the contiguous, longitudinal edges of said bag in the S-shaped folded area are bonded together to form a pocket open at the transverse edge contiguous to said front diapering area, said pocket being located to receive urine and retain urine separate from feces, which is received in said rear diapering area.

4,573,991

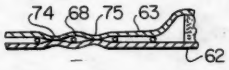
GATHERABLE LAMINATED STRUCTURE INCLUDING AN APERTURED ELASTIC MEMBER

Heinz A. Pieniak, North Brunswick, N.J., and Virginia R. Mesek, Oak Forest, Ill., assignors to Personal Products Company, Milltown, N.J.

Continuation of Ser. No. 386,451, Jun. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 210,507, Nov. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 134,369, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 60,704, Jul. 27, 1979, abandoned. This application Jul. 23, 1984, Ser. No. 633,568

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—385 A **7 Claims**



1. A laminated structure adapted to be gather for improved fit about a portion of the human body comprising: first and second layers positioned adjacent to one another, said layers being formed of flexible gatherable material, an elastic member disposed between said layers, said elastic member consisting of longitudinal and transverse interconnected elastic elements and being reticulated with apertures comprising a net-like construction, said second and first layers being secured together through at least some of said apertures.

4,573,992

APPARATUS FOR RECEIVING AND REINFUSING BLOOD

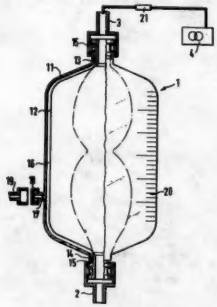
Günter H. Marx, Gauting, Fed. Rep. of Germany, assignor to Solco Basel AG, Birsfelden, Switzerland

Filed May 12, 1983, Ser. No. 494,094

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218561

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—408 **8 Claims**



1. An apparatus for receiving blood from a patient and reinfusing the blood into the patient, comprising: a deformable container, first connection means on the deformable container for connecting the deformable container to a suction line for aspirating blood from the patient, second connection means on the deformable container for connecting the deformable container to a reduced pressure source for sucking the blood into the deformable container from said suction line, one of said connection means also forming means for reinfusing blood from the deformable container into the patient, an outer container of substantial rigidity and having an inside surface defining with the outside of the deformable container a fluid-tight space, and third connection means on said outer container for selectively closing said space to prevent collapse of the deformable container during sucking of blood thereinto, and for connecting said space with a source of a fluid medium for increasing the pressure in said space for reinfusing the blood into the patient from said deformable container through said one connection means.

4,573,993

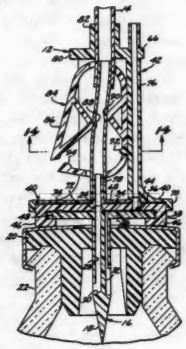
FLUID TRANSFER APPARATUS

Robert E. Hoag, Irvine, and Axel Mnich, Fallbrook, both of Calif., assignors to Instafil, Inc., Irvine, Calif.

Filed Sep. 29, 1983, Ser. No. 537,055

Int. Cl.⁴ A61J *1/00*

U.S. Cl. 604—411 **15 Claims**



1. Fluid transfer apparatus comprising:

a cannula including a proximal extremity and a distal extremity adapted to extend into a vessel into which fluid is to be transferred, said cannula having cannula attachment means adjacent said proximal extremity, a distal filling passage and a distal vent passage;

a handle including a handle base having handle attachment means coupled to said cannula attachment means for mounting said cannula to said handle, said handle including a proximal filling passage in fluid communication with said distal filling passage for conveying fluid into said vessel, and an elongated tubular conduit defining a proximal vent passage in fluid communication at one extremity with said distal vent passage and open at its opposite extremity for venting said vessel to atmosphere or for connection to the conduit of a vacuum system for venting into the vacuum system, said cannula attachment means and said handle attachment means being movable relative to each other for rapid coupling and decoupling to enable mounting and demounting of said cannula relative to said handle and mounting of a replacement cannula;

flexible conduit means coupled at one extremity to said proximal filling passage and extending through said handle, said conduit means being adapted for connection at its opposite extremity to a source of fluid; and

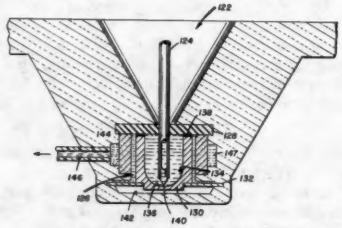
occluding means carried by said handle and operative to control fluid flow through said conduit means.

4,573,994

REFILLABLE MEDICATION INFUSION APPARATUS

Robert E. Fischell, Silver Spring, Md., and Peter C. Lord, Valencina, Calif., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 34,155, Apr. 27, 1979, Pat. No. 4,373,527. This application Dec. 7, 1981, Ser. No. 327,818
Int. Cl.[4] A61M 7/00
U.S. Cl. 604—891 64 Claims



1. A system having a medication infusion apparatus including a medication container and an apparatus for filling the medication container, said system comprising in combination:

a medication container having an input;

a dispensing means adapted to communicate with said input of said medication container; and,

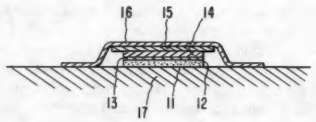
a valve, operably disposed at said input of said medication container, said valve comprising a reciprocally mounted valve poppet which is urged into an open position when a portion of said dispensing means is disposed in a preselected position in said medication infusion apparatus, removal of said portion of said dispensing means from said preselected position causing said valve poppet to be urged into a closed position, said dispensing means in fluid communication with said medication container only when said valve poppet is urged into said open position.

4,573,995

TRANSDERMAL THERAPEUTIC SYSTEMS FOR THE ADMINISTRATION OF NALOXONE, NALTREXONE AND NALBUPHINE

Yu-Ling Chen, Cupertino; Leslie L. Chun, Palo Alto, and David J. Enscore, Sunnyvale, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 9, 1984, Ser. No. 659,122
Int. Cl.[4] A61K 9/00
U.S. Cl. 604—896 33 Claims



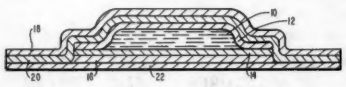
1. A composition of matter for the transdermal administration of a drug selected from the group consisting of naloxone, naltrexone and nalbuphine and mixtures thereof, comprising a matrix containing the base form of the drug and a skin permeation enhancing amount of polyethylene glycol monolaurate.

4,573,996

DEVICE FOR THE ADMINISTRATION OF AN ACTIVE AGENT TO THE SKIN OR MUCOSA

Alfred Kwiatek, New York, N.Y., and Jack W. Schwartz, Burlington, Vt., assignors to Jonergin, Inc., Swanton, Vt.

Filed Jan. 3, 1984, Ser. No. 567,540
Int. Cl.[4] A61L 15/06
U.S. Cl. 604—897 25 Claims



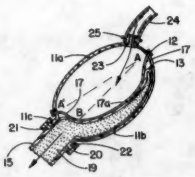
1. A device for the administration of an active agent to the skin or mucosa of a host comprising a reservoir containing said active agent, said reservoir including an inner surface and an outer surface, an active agent permeable membrane layer formed on said inner surface of said reservoir, said active agent permeable membrane layer including an outer surface facing said reservoir and an inner surface, an active agent impermeable barrier layer formed on said outer surface of said reservoir, so that said reservoir is completely enclosed between said active agent permeable membrane layer and said active agent impermeable barrier layer, said active agent impermeable barrier layer having an inner surface facing said reservoir and an outer surface, and extending peripherally beyond said reservoir about the entire periphery thereof so as to create an extended peripheral area of said active agent impermeable barrier layer, an active agent impermeable adhesive layer applied to said inner surface of said extended peripheral area of said active agent impermeable barrier layer, and an active agent permeable adhesive layer applied to said inner surface of said active agent permeable membrane layer, whereby substantially the entire inner surface of said device contains either said active agent impermeable adhesive layer or said active agent permeable adhesive layer, each of said active agent impermeable adhesive layer and said active agent permeable adhesive layer being adopted to adhere to the skin or mucosa of said host so as to permit said device to be firmly adhered thereto, whereby active agent can be released through said active agent permeable membrane layer and said active agent permeable adhesive layer to said skin or mucosa to provide a continuous dose of said active agent thereto, but cannot permeate through said active agent impermeable barrier layer or radially outward through said active agent impermeable adhesive layer.

4,573,997

RIGHT VENTRICULAR ASSIST DEVICE

Craig B. Wisman, Harrisburg; William Pierce, Hummelstown, and James H. Donachy, Annville, all of Pa., assignors to Research Corporation, New York, N.Y.

Filed Mar. 19, 1984, Ser. No. 590,813
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 15 Claims



1. A right ventricluar assist device for assisting the circulation of the blood, said device comprising:

(a) a smooth seamfree ellipsoidal sac formed of segmented

polyurethane for receiving blood to be circulated, said sac having a single valveless passageway to provide a single inlet and outlet,

(b) a rigid ellipsoidal shell surrounding said sac, said shell having X, Y and R axes, wherein X and Y define an ellipse, and R defines a radius rotated to form the ellipsoid, said ellipsoid having a longitudinal axis and an equatorial plane, said shell having a first opening for said single valveless passageway generally aligned with said longitudinal axis and a second opening for pressurizing an interior portion of said shell,

(c) A flexible diaphragm extending across the interior of said shell, said diaphragm providing a means for alternately expanding and collapsing said sac, said diaphragm dividing the interior of the ellipsoidal shell into two unequal volumes, with the sac and first opening in a first and larger volume, and the second opening and a pressurizing chamber defined in a second and smaller volume, the perimeter of said diaphragm defining an ellipitical plane that is angled with respect to said equatorial plane to expel at least 80% of the blood present in said sac as a positive pressure is supplied through said second opening, said diaphragm being angled and dimensioned to prevent the collapse of said sac when blood is expelled therefrom;

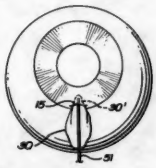
(d) means for grafting the valveless passageway to a pulmonary artery.

4,573,998

METHODS FOR IMPLANTATION OF DEFORMABLE INTRAOCULAR LENSES

Thomas R. Mazzocco, Granada Hills, Calif., assignor to Staar Surgical Co., Monrovia, Calif.

Filed Feb. 5, 1982, Ser. No. 346,105
Int. Cl.[4] A61F *2/16*; A61B *17/00, 17/28*
U.S. Cl. 623—6 **24 Claims**



1. A method for implantation of an artificial intraocular lens for replacement of a surgically removed crystalline lens, the method comprising the steps of:

providing an intraocular lens having a deformable optical zone portion with prescribed memory characteristics; deforming said intraocular lens by compressing said optical zone portion to a diameter of about 80% or less of the cross-sectional diameter of the optic in an unstressed state; inserting the intraocular lens through a relatively small incision made in the ocular tissue; allowing the lens implant to return to its original configuration, full size and fixed focal length after insertion in the eye; whereby a safer, more convenient surgical procedure and more comfortable fit for the eye is achieved.

4,573,999

HUMAN BREAST PROSTHESIS

Daniel J. Netto, 153 N. Vendome St., Los Angeles, Calif. 90026

Filed Oct. 14, 1983, Ser. No. 541,994
Int. Cl.[4] A61F *1/00*
U.S. Cl. 623—7 **7 Claims**

1. A prosthetic implant for surgical implantation within living tissue, said implant comprising body means having undulations over a substantial portion of its exteriorly directed surface, said undulations defining a plurality of predetermined substantially concentric peaks and intervening valleys about a substantially vertical projection axis, said surface of said body means being made of material sufficiently rigid to maintain the shape of said peaks and valleys in the absence of pressure against said exteriorly directed surface, but yieldable to pressures on said exteriorly directed surface by any fibrous growth which may bridge said valleys, whereby said pressures tend to displace the material of said body means and flatten said peaks rather than acting against any adjacent living tissue.

2. An implant according to claim 1, wherein said body means comprises a filling material and a covering enveloping and containing said filling material.

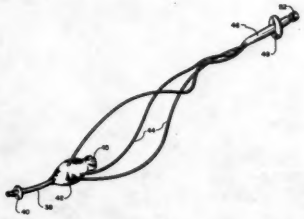
3. An implant according to claim 2, wherein said filling material is a fluid.

4,574,000

ARTIFICIAL FALLOPIAN TUBE

Stephen K. Hunter, 1402 S. 1025 West, Syracuse, Utah 84041

Filed Aug. 24, 1984, Ser. No. 644,315
Int. Cl.[4] A61F *2/04*; A61M *25/00*
U.S. Cl. 623—12 **23 Claims**



1. A prosthetic fallopian tube adapted for surgical placement in a patient lacking functional natural fallopian tubes, comprising:

means for collecting ova discharged by one of the patient's ovaries;

means for communicating between the collecting means and the patient's uterine cavity so that ova collected by the collecting means can pass into the uterine cavity;

means for carrying fluid into the collecting means such that ova collected by the collecting means will be carried from the collecting means to the uterine cavity; and

means for controlling the rate that fluid is carried into the collecting means so that the ovum is ejected into the uterine cavity at a time when nidation is possible.

CHEMICAL

4,574,001
PROCESS FOR PRODUCING FINELY DIVIDED DISPERSIONS OF METAL OXIDES IN ALUMINUM HYDROXIDE

Klaus Bielfeldt, Konigswinter, and Dieter J. Braun, Kriegsdorf, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminiumwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,259

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1983, 3308008

Int. Cl.[4] B01D *9/02*

U.S. Cl. 23—301 **8 Claims**

1. A process for producing finely divided dispersions of metal oxide particles having a coating of aluminum hydroxide comprising:

seeding a supersaturated sodium aluminate liquor containing dissolved aluminum hydroxide with seed particles of at least one metal oxide;

subjecting the seeded liquor to predetermined crystallization conditions for from about 24 to about 72 hours to form crystallized solid metal oxide particles having an aluminum hydroxide coating;

separating the crystallized solid particles from the liquor; and

drying the crystallized solid particles obtained.

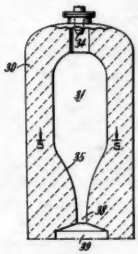
4,574,002
COAL GASIFICATION COMBUSTION CHAMBER STRUCTURE

Devendra T. Barot, W. Covina, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed May 24, 1984, Ser. No. 615,658

Int. Cl.[4] C10J *3/48, 3/72*

U.S. Cl. 48—77 **1 Claim**



1. In a down flow generator for coal gasification having a refractory lined floor with a throat therethrough ending in an exit for product gas, slag and fly ash, the improvement comprising

said throat being round in cross-section and shaped approximately in accordance with the ratios employed in a contraction cone of a wind tunnel to produce monotonically increasing flow of fluid velocity therethrough whereby said product gas, slag and fly ash are discharged having an equal velocity profile diametrically across said throat at the exit end thereof.

4,574,003
PROCESS FOR IMPROVED DENSIFICATION OF SOL-GEL PRODUCED ALUMINA-BASED CERAMICS

Alvin P. Gerk, Lewiston, N.Y., assignor to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed May 3, 1984, Ser. No. 606,500

Int. Cl.[4] C04B *35/10;* **C09C** *1/68*

U.S. Cl. 51—309 **9 Claims**

1. In the sol-gel process for forming a dense, solid, alumina-based ceramic, the process comprising:

a. preparing an aqueous dispersion of aluminum oxide monohydrate containing a precursor of a modifying additive which is a metal-containing compound in the form of a strongly oxidizing, soluble salt;

b. gelling the dispersion;

c. drying the gelled dispersion to form a solid;

d. calcining the solid; and

e. sintering the calcined solid,

the improvement comprising adding to the aqueous dispersion at least about 10 weight percent, based upon the oxide equivalent of the soluble salt precursor, of at least one densification aid selected from the group consisting of ethylene glycol, polyethylene glycol, propylene glycol, polypropylene glycol, glycerine, and di-isopropanol amine, said densification aid providing in the ceramic produced by said process a density which is noticeably increased over that produced by the same process without said densification aid.

2. The process of claim 1 where the metal-containing compound is at least one precursor of the oxides of magnesium, zinc, cobalt, nickel, zirconium, hafnium, chromium and titanium.

3. The process of claim 2 where the anion of the precursor is a nitrate or perchlorate.

9. The process of claim 1 where the dense, alumina-base ceramic is an abrasive grain.

4,574,004
METHOD FOR CHARGING PARTICLES SUSPENDED IN GASES

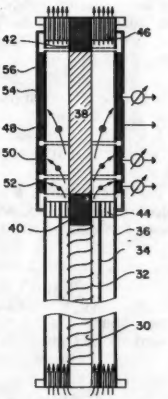
Andreas Schmidt-Ott, 12 Am Holbrig, and Hans-Christoph Siegmann, 24 Kurberstrasse, both of CH-8049 Zurich, Switzerland

Continuation of Ser. No. 323,463, Nov. 20, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 597,056

Claims priority, application Switzerland, Oct. 28, 1980, 8002/80

Int. Cl.[4] B03C *3/12, 3/38;* **H01J** *27/24*

U.S. Cl. 55—4 **7 Claims**



1. A method for electrically charging small particles suspended in a gas, in a material and surface sensitive, non-destructuve manner, comprising the steps of:

irradiating a gas containing small particles in suspension by exposing the gas to ultraviolet radiation of photon energy above the photo-threshold of the particles and below the ionization threshold of the gas to generate, substantially solely by photoemission of electrons from the particles, positively charged particles, photoelectrons, and nega-

tively charged small ions formed by attachment of photoelectrons to gas molecules;

absorbing and neutralizing diffused photoelectrons and small ions by absorption onto a charge absorbing surface having a constant electric potential and a sufficient surface conductivity at a low photoelectric yield to avoid charge buildup and increase of negative mobile charge, and

causing the charged particles to remain in the vicinity of the charge absorbing surface for a time insufficient to permit substantial precipitation of the positively charged particles at said surface.

4,574,005

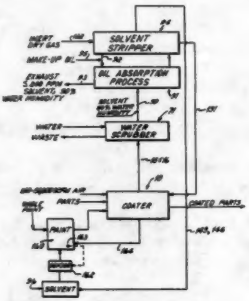
CONTINUOUS COATER SOLVENT RECOVERY PROCESS

Walter H. Cobbs, Jr., Amherst; Robert J. Huddleston, Bay Village, both of Ohio, and Robert A. Guldner, San Francisco, Calif., assignors to Nordson Corporation, Amherst, Ohio

Continuation of Ser. No. 545,600, Oct. 26, 1983, abandoned, which is a continuation of Ser. No. 363,091, Mar. 29, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,103

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—48 **9 Claims**



1. A process for the recovery of a blend of solvents in a spray coating system and for reintroducing the recovered blend of solvents back into the spray coating system, said system including a chamber for spray coating of workpieces, a coating supply system for supplying coating material containing hydrocarbon solvent blends to said chamber, an exhaust system for removing coating material overspray from the chamber including a water scrubber to remove airborne coating material particles, and a system for recovering coating material from the chamber and returning it to said coating supply system, said process comprising the steps of:

(a) extracting a stream containing a mixture of air, water vapor and hydrocarbon solvent vapors from said exhaust system at a rate of about 500 to 50,000 standard cubic feet per minute;

(b) subjecting said stream to an absorption process which employs a hydrophobic absorption medium to absorb all but about 200 ppm of said blend of solvent vapors in said stream while the air and water vapor contained in said stream passes through said absorption process;

(c) separating said blend of solvent vapors from said hydrophobic absorption medium by stripping said solvent vapors therefrom with a dry inert gas;

(d) returning the hydrophobic absorption medium to said absorption process, said medium now containing less than about 0.001 mole fraction of any one solvent;

(e) recovering said blend of solvent vapors substantially free of water and said hydrophobic absorption medium; and

(f) returning said recovered blend of solvents to said spray coating system (1) by introducing said recovered blend of solvent vapors into said chamber to increase the solvent humidity in said chamber to thereby retard the evaporation of solvent from said coating material supplied to said chamber, (2) by condensing said recovered blend of solvent vapors recovered in step (e) and introducing the condensed blend of solvents to said system as a liquid to return solvent lost in the coating process to the coating supply system, or (3) by a combination of steps (1) and (2), said blend of solvents being returned in substantially the same proportion as in the stream extracted in step (a).

4,574,006

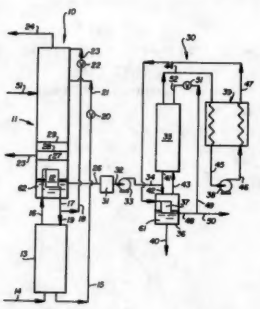
PROCESS TO PRODUCE A KRYPTON-XENON CONCENTRATE FROM A LIQUID FEED

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 16, 1984, Ser. No. 641,553

Int. Cl.[4] F25J *3/04*

U.S. Cl. 62—22 **16 Claims**



1. A process for the production of a krypton-xenon concentrate from a liquid feed, while also recovering a liquid product substantially free of rare gases, comprising enabling avoidance of excessive complication(s) occasioned by the handling of oxygen by the steps of:

(A) providing a feed liquid comprising oxygen, krypton and xenon to a reboiling zone to form a reboiling liquid;

(B) partially vaporizing the reboiling liquid to produce a vapor, and a liquid krypton-xenon concentrate;

(C) recovering krypton-xenon concentrate;

(D) passing the vapor against downflowing reflux liquid in a column;

(E) stripping krypton and xenon from the vapor to the reflux liquid to produce a lean vapor and a richer liquid;

(F) passing the richer liquid to the reboiling zone to form part of the reboiling liquid;

(G) withdrawing lean vapor from the column;

(H) heating the withdrawn lean vapor;

(I) compressing the heated lean vapor;

(J) cooling the compressed lean vapor by indirect heat exchange with the heating lean vapor;

(K) condensing the cooled lean vapor in the reboiling zone by indirect heat exchange with the partially vaporizing reboiling liquid to produce a lean liquid;

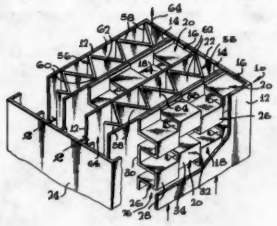
(L) passing a portion of the lean liquid to the column to form said reflux liquid; and

(M) recovering a portion of lean liquid as liquid product substantially free of rare gases.

4,574,007
FRACTIONATING APPARATUS

James D. Yearout, 270 Portofino Way, #303, Redondo Beach, Calif. 90277; Robert R. Provin, 5241 Loyola Ave., Westminster, Calif. 92683, and John S. Browne, 15965 Stanmont St., Whittier, Calif. 90603

Filed Sep. 6, 1984, Ser. No. 647,901
Int. Cl.[4] F25J 3/02
U.S. Cl. 62—42 21 Claims



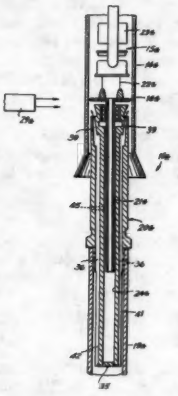
1. Fractionating apparatus especially adapted for non-adiabatic distillation comprising means designed for continuous separation and intermixing of the adjacent vapor streams and intermixing thereof with descending liquid and additional liquid holdup, sufficient to provide efficient non-adiabatic fractionation, including a unit having two series of corrugated sheets disposed in horizontal relation across said unit, each of said series of corrugated sheets extending vertically of said unit, the sheets of each said series of sheets being in substantially horizontal alignment, with each of said series of corrugated sheets offset vertically from the adjacent series of corrugated sheets, each corrugated sheet forming a plurality of vertically disposed fins, and forming a plurality of vertically disposed side channels between alternate offset corrugations of alternate corrugated sheets, said side channels providing a tortuous vertical path for upward flow and intimate mixing of vapor, and providing a descending path of flow of liquid from said fins on adjacent corrugations of adjacent corrugated sheets, through said side channels, and intimate mixing of the liquid phase, and intimate mixing of the vapor phase with the liquid phase, the fins on adjacent offset corrugations also providing liquid holdup of the descending liquid.

4,574,008
APPARATUS FOR MOUNTING AN ELECTRON GUN ASSEMBLY WITHIN THE GLASS NECK OF A CATHODE RAY TUBE

Masahiro Kobayashi, San Diego, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,609
Int. Cl.[4] C03B 23/217
U.S. Cl. 65—155 16 Claims

11. An electron gun mounting tube for use in an apparatus in which an electron gun assembly having a glass stem and exhaust tubulation, and metallic leads extending through the stem is assembled within the glass neck of a cathode ray tube envelope by welding said stem and said glass neck together with an inert gas being supplied into said glass neck through said electron gun mounting tube; said electron gun mounting tube having a central bore which is closed at its lower end and opened at its upper end for receiving said exhaust tubulation when an electron gun is mounted on the tube, said tube further having longitudinal passages for passing said inert gas to said glass neck and being spaced outwardly from said central bore and isolated from the latter, said longitudinal passages each

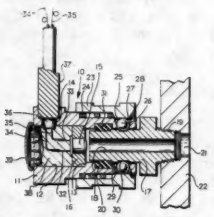


opening at one end adjacent said upper end of the mounting tube.

4,574,009
GOB ARRIVAL SENSOR FOR A GLASS FORMING MACHINE

Mathias P. Welker, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 7, 1985, Ser. No. 689,350
Int. Cl.[4] C03B 7/08
U.S. Cl. 65—158 6 Claims



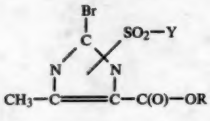
1. In apparatus for sensing the passage of a gob of molten glass through a gob deflector or guide, the improvement comprising, a nipple fixed in and extending from a radial opening adjacent the lower end of the gob deflector, a hollow, quick-disconnect housing adapted to fit over said nipple, said housing being formed with a longitudinal passage therethrough with the quick-disconnect feature forming one end of the passage, a washer-shaped spacer lying in a plane, normal to the axis of said passage and intermediate the ends thereof, a phototransistor with a pair of leads mounted in an opening in said spacer with its leads extending into the other end of said passage, an elongated cable, an elongated high temperature insulating sleeve, a pair of insulated wires within said insulating sleeve, said wire containing sleeve extending within said housing with one end of said wires positioned in said other end of said housing, means connecting the wires to said transistor leads, a plug closing the opening in the other end of said housing, and means connecting the other end of said wires to a gob arrival signal device.

4,574,010
HERBICIDAL ESTERS OF N-SUBSTITUTED 2-BROMO-4-METHYLIMIDAZOLE-5-CARBOXYLIC ACID

Andrea Leone-Bay, Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 6, 1985, Ser. No. 730,927
Int. Cl.[4] A01N *43/50*; C07D *233/90*
U.S. Cl. 71—92 **17 Claims**

9. The method of controlling undesirable vegetation comprising applying to the area where control is desired an herbicidally effective amount of a compound having the structural formula



wherein R is C_1–C_{10} alkyl and Y is C_1–C_6 alkyl optionally substituted with halogen or $—N(R')_2$ wherein R' is C_1–C_{10} alkyl.

4,574,011
SINTERED ALLOY BASED ON CARBIDES

Christian Bonjour, and Francois Duvanel, both of Nyon, Switzerland, assignors to Stellram S.A., Nyon, Switzerland

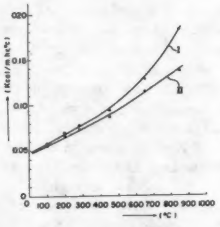
Filed Mar. 6, 1984, Ser. No. 586,790
Claims priority, application Switzerland, Mar. 15, 1983, 1421/83
Int. Cl.[4] C22C *19/03, 19/07, 28/00, 29/02*
U.S. Cl. 75—241 **8 Claims**

1. Sintered alloy for use in the manufacture or ornamental articles and consisting essentially of 75 to 90% by weight of a mixture of carbides and 10 to 25% by weight of a binder, said binder consisting essentially of 60 to 70% by weight of Ni, Co and Ru, and 30 to 40% by weight of molybdenum carbide, and in which the Ru is present in a quantity of 10 to 25% of the whole of the three elements Co, Ni and Ru, the density of the alloy being 7.5 to 8.0.

4,574,012
CALCIUM SILICATE SHAPED PRODUCT

Yasuo Oguri, Tokyo; Mitsuru Awata, Kodaira, and Noriyuki Ariyama, Hino, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,828
Claims priority, application Japan, Feb. 24, 1982, 57-28358
Int. Cl.[4] C04B *7/34*; E04B *1/76*
U.S. Cl. 106—120 **7 Claims**

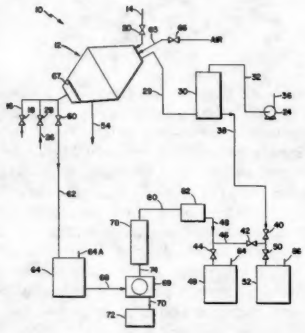


1. A shaped calcium silicate product in which the shaped calcium silicate matrix material has incorporated therein particles of silicon carbide, silicon nitride or ilmenite, said shaped calcium silicate matrix material being prepared by dispersing a calcareous material and a siliceous material selected from the group consisting of diatomaceous earth, ground quartzite, quartz, silicon dust and silicon containing industrial by-products in water; heating the dispersion to react said calcareous and siliceous materials, thereby forming a calcium silicate slurry; press filter molding said slurry in a filter press; and drying said molded material.

4,574,013
METHOD FOR DECONTAMINATING SOIL

Robert L. Peterson, North Syracuse, N.Y., assignor to Galson Research Corporation, East Syracuse, N.Y.

Filed Apr. 18, 1985, Ser. No. 724,642
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—2 **21 Claims**



1. A method of decontaminating soil contaminated with a halogenated organic compound, said method including the steps of: forming a slurry of the contaminated soil and a reagent mixture comprising a sulfoxide catalyst and an alkali constituent which is: an alkali metal hydroxide, a mixture of an alkali metal hydroxide and an alcohol, or an alkoxide and maintaining said slurry under temperature and pressure conditions which are effective to promote halogen displacement reactions between said halogenated organic compound and the alkali.

4,574,014
PROCESS FOR MANUFACTURING A FORMED CONTACT PART

Dieter Stöckel, Birkenfeld, and Friedrich E. Schneider, Pforzheim, both of Fed. Rep. of Germany, assignors to G. Rau GmbH & Co., Pforzheim, Fed. Rep. of Germany

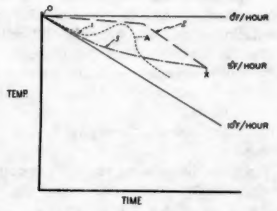
Filed Oct. 1, 1984, Ser. No. 656,631
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335274
Int. Cl.[4] C21D *8/12*
U.S. Cl. 148—11.5 P **6 Claims**

1. In the manufacture of a formed bimetallic rivet having a contact part with constituents which include at least one noble metal, said constituents forming a metal alloy, wherein the contact part is shaped and butt welded to a wire-shaped length of a carrier material, the improvement which comprises forming from the alloy constituents a wire-shaped composite material in which the alloy constituents are heterogeneously embedded, cutting the composite material and the carrier material into lengths, butt-welding of the lengths of the composite and the carrier material, forming a bimetallic rivet from said butt welded lengths, subjecting said bimetallic rivet to heat treatment so as to convert the composite material into the alloy.

4,574,015
NICKLE BASE SUPERALLOY ARTICLES AND METHOD FOR MAKING

Paul D. Genereux, Cromwell, and Daniel F. Paulonis, Higganum, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1983, Ser. No. 565,490
Int. Cl.[4] C22F 1/10
U.S. Cl. 148—11.5 N **26 Claims**



1. A method for increasing the forgeability of a nickel base superalloy article which comprises:

heat treating the article so as to solutionize a substantial amount of the gamma prime phase and slow cooling the article to a temperature below the gamma prime solvus start temperature to produce a coarse overaged gamma prime structure.

4,574,016
METHOD OF TREATING STEEL FOR A VEHICLE SUSPENSION SPRING HAVING A GOOD SAG-RESISTANCE

Toshiro Yamamoto; Ryohei Kobayashi; Mamoru Kurimoto, and Toshio Ozone, all of Aichi, Japan, assignors to Aichi Steel Works, Ltd., Tokai and Chuo Hatsujo Kabushiki Kaisha, Nagoja, both of, Japan

Division of Ser. No. 289,852, Aug. 4, 1981, Pat. No. 4,448,617. This application Mar. 2, 1984, Ser. No. 585,479
Claims priority, application Japan, Aug. 5, 1980, 55-108020; May 16, 1981, 56-74639
Int. Cl.[4] C21D 9/02
U.S. Cl. 148—144 **13 Claims**

1. A process for improving the sag-resistance of a vehicle suspension spring, comprising the steps of:

preparing alloy spring steel consisting essentially of by weight 0.50–0.80% carbon, 1.50–2.50% silicon, 0.50–1.50% manganese and 0.05–0.50% niobium, the remainder being iron together with impurities;

rapidly heating the alloy spring steel to an austenitizing temperature from about 900° to 1200° C. for dissolving carbide of niobium in the austenite; and

quenching and tempering at a tempering temperature from about 400° to 580° C. for precipitating dissolved carbide of niobium as a fine carbide of niobium in the martensite structure.

4,574,017
METHOD FOR SECURING CONCRETE FORM BOARD TO POOL AND MAINTAINING CONCRETE FROM POOL LINER TRACK

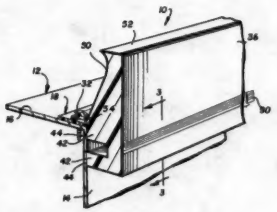
William J. Stegmeier, 3313 Ambassador Row, Arlington, Tex. 76013

Filed Oct. 18, 1984, Ser. No. 663,066
Int. Cl.[4] F04G 17/00; B28B 7/06; E04B 1/16
U.S. Cl. 156—60 **10 Claims**

1. A method for achieving a standard relationship in mounting a coping form board to a pool mouth-bounding structure which has an inwardly-opening, constricted-mouthed pool liner track provided thereon perimetrically of the pool mouth above an at least generally vertically-oriented, inwardly-facing surface of the pool mouth-bounding structure, so as to provide a form for molding the inner end surface of coping for the pool from an originally fluent, settable composition such as concrete,

said method comprising:

providing said coping form board to have an outer face having a profile on an upper portion thereof suitable for molding the inner end surface of coping for the pool, to have at least one outwardly-presented, foot sole on a lower portion thereof and, between said upper and lower portions, to have at least one outwardly projecting, longitudinally extending outwardly tapering protrusion which,



basally thereof, is at least slightly thicker when free than the corresponding degree of openness dimension of said constricted-mouthed pool liner track;

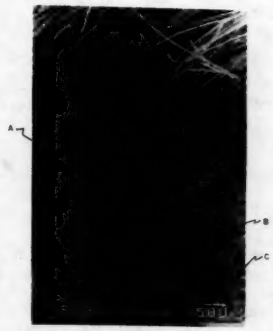
at least generally aligning said at least one protrusion form board with the mouth of the pool liner track; and

pushing the coping form board outwardly towards said pool mouth-bounding structure sufficiently to cause said at least one protrusion to forcibly enter said pool liner track through the mouth thereof and to cause the at least one foot sole to engage said at least generally vertically-oriented, inwardly-facing surface of the pool mouth-bounding structure.

4,574,018
PILE FABRIC PRODUCTION PROCESS

Yutaka Masuda, and Teruo Nakamura, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 567,265
Claims priority, application Japan, Jan. 7, 1983, 58-446
Int. Cl.[4] D04H 11/00; B32B 5/02
U.S. Cl. 156—72 **10 Claims**



1. A process for producing a pile fabric which comprises providing a fiber base composed of composite fibers, which fibers comprise at least two individual components, applying an adhesive to said fiber base, electrostatically implanting short flock fibers in said adhesive and fiber base, hardening said adhesive with said short fibers in place, and thereafter removing at least one component of the fiber base.

4,574,019

PROCESS FOR ATTACHING ANODE BLOCKS TO AN ANODE SUSPENSION MEANS

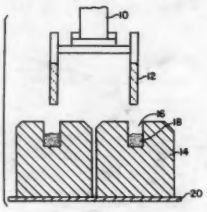
Hans Friedli, and Edwin Gut, both of Steg, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 7, 1985, Ser. No. 689,300

Claims priority, application Switzerland, Jan. 18, 1984, 216/84

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—73.6 13 Claims



1. Process for adhesively attaching carbon anode blocks to stud means of an anode suspension means which comprises: placing an adhesive in holes in the anode block; inserting the stud means into the adhesive; preheating at least one of the stud means and anode block at least in the region of the holes wherein the stud means is preheated to a temperature between 30° and 60° C. and the anode block is preheated to a temperature between 25° and 40° C., wherein the preheating is such that the temperature of the adhesive exceeds 25° C. at least 60 seconds after inserting the stud means; vibrating at least one of the anode blocks and the anode suspension means until the stud means come to rest on the bottom of the holes under the force of their own weight; and at least partially hardening the adhesive.

4,574,020

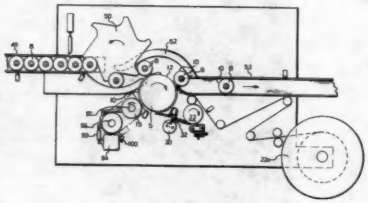
APPARATUS AND METHOD FOR WRAPPING A PLASTIC LABEL AROUND A CONTAINER

Harold R. Fosnaught, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1983, Ser. No. 555,758

Int. Cl.[4] B65C *3/16, 9/22*

U.S. Cl. 156—80 10 Claims



1. In apparatus for wrapping a plastic label about a bottle and adhering the label to the bottle, where the label is a composite sheet of a solid polymer layer and foam polymer layer with the foam layer being applied to the bottle surface, the improvement comprising, just before wrapping, means for applying a solvent for the polymer of the foam polymer layer to at least two finite areas of the surface of the foam layer with one area adjacent the leading edge of the label and the other area constituting a full height strip along the trailing edge of the label the solvent dissolving the polymer of the foam layer rapidly to form a momentary tacky bond at the finite areas of the leading edge sufficient to tack the label to the container, the leading edge bond becoming weaker and weaker as the solvent evaporates, and means for rolling a bottle along the solvent treated label with the leading edge momentarily tacked to the bottle and the trailing edge bonding to itself to form an overlapping seam in which the trailing edge finite area bond becomes stronger and stronger, wherein said means for applying a solvent to the label comprises a rotating gravure roll having at least two areas of indentation in its surface, with each area being circumferentially spaced from the other a distance slightly less than the full length of a label, means for moving the foam surface of the label into engagement with the gravure roll, and means engaging the gravure roll surface for applying the solvent to the areas of indentation in said gravure roll, said solvent supplying means further comprises an elevated container for said solvent, means for cooling the solvent in said container, means connecting the bottom of said solvent container to the bottom of said fountain and means connected to the top of said fountain for returning excess solvent from said fountain to said elevated container.

3. In a method of providing a label around a container having a body whereby the label is wrapped around the container and the plastic label comprises a foam polymer layer, the method comprising the steps of:

A. transporting toward a wrapping station a sheet of the plastic label stock whereby the transporting is continuous and the length axis of the stock is parallel to the horizontal;

B. cutting the stock to form a plurality of labels of a desired length;

C. moving the leading edge of the label to a vacuum drum;

D. placing and guiding the label on the periphery of the drum with the top face next to the peripheral drum surface; and

E. wrapping the label around the container, the improvement comprising:

F. just before wrapping, applying a low boiling, quick evaporating solvent for the polymer of the foam layer to the underside of the foam layer in at least a finite area adjacent the leading edge of the label to form a momentary tacky bond that is a viscous tacky solution of the polymer in the solvent in the finite area, the bond between the label and the container becoming weaker and weaker after wrapping, whereby the label can be easily and cleanly stripped from the container so the container can be recycled; and

G. applying the solvent to a finite area of the trailing edge to form a solid adhesive bond between the foam layer and the overlapped end of the label, the bond at the overlapped ends becoming stronger and stronger.

4,574,021

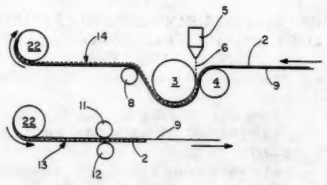
SOFT MOISTURE RESISTANT TISSUE PRODUCT

Dan D. Endres, and Attila Matray, both of Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 471,574, Mar. 3, 1983, Pat. No. 4,489,118. This application Aug. 6, 1984, Ser. No. 638,831

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—152 2 Claims



1. A process for making a multi-layered tissue comprising: (a) extruding a thermoplastic coating onto a first tissue ply,

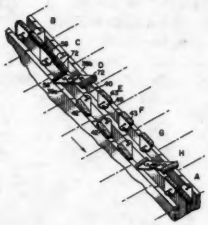
said first tissue ply being in superposed and unattached contacting relationship with a second tissue ply;
(b) cooling the thermoplastic coating to form a plastic film which is substantially bonded overall to said first tissue ply;
(c) winding the superposed plies onto a roll wherein either the first ply or the second ply is toward the center of the roll;
(d) unwinding said roll by first unwinding only the ply not toward the center of the roll as described in step (c) for one revolution of the roll and thereafter unwinding said first and second plies together, such that the plastic film is between said first and second plies; and
(e) sufficiently bonding said plies together to maintain the integrity of the product.

4,574,022

APPARATUS AND METHOD FOR TRANSFERRING AND APPLYING MATERIAL

Carl W. Johnson, Neenah, and Stanley W. Kotschi, Oshkosh, both of Wis., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed Mar. 5, 1984, Ser. No. 586,137
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—164 **36 Claims**



1. An apparatus for applying discrete lengths of an elastic material to a moving web, said apparatus comprising:
(a) means for supplying an elastic material;
(b) a plurality of applicator units, each applicator unit having a first applicator segment and a second applicator segment, wherein said material is supplied onto said first and second applicator segments.
(c) means for rotating said plurality of applicator segments around a drum axis;
(d) means for creating corrugations, having peaks and valleys, in the moving web;
(e) means for feeding the web to said corrugating creating means;
(f) means for bonding said material to the said peaks of the moving web; and
(g) means for rotating said first applicator segment around a first axis and said second applicator segment around a second axis, wherein said first and second applicator segments are linearly aligned when passing under said supply means, then said first and second applicator segments rotate around said first and second axes to place said first and second applicator segments in spaced relationship when said material is bonded to said peaks of the web, then said first and second applicator segments rotate around said first and second axes to place said first and second applicator segments back in linear alignment.

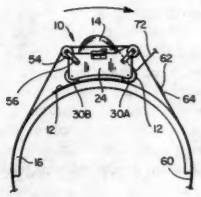
27. A method of applying discrete lengths of an elastic material to a moving web, said method comprising:
(a) feeding a web material to a corrugating roll, the corrugated roll, having an outer surface having plurality of peaks and valleys and a plurality of holes;
(b) causing the web to go into the valleys of the roll;
(c) transferring the elastic material onto a plurality of applicator units, each applicator unit having a first and second applicator segment, wherein the material is transferred onto said first and second applicator segments;
(d) holding the material on the applicator segments until the applicator segments reach a transfer point;
(e) rotating the plurality of applicator units around a drum axis;
(f) rotating the first applicator segment around a first axis and rotating the second applicator segment around a second axis, wherein said first and second applicator segments are linearly aligned when the elastic material is transferred to the applicator segments, then said first and second applicator segments rotate around the first and second axes to place the first and second applicator segments in spaced relationship;
(g) transferring the elastic material from the applicator segments to the peaks of the moving web on the corrugating roll;
(h) continuing the rotation around the drum, first and second axes, wherein the first and second applicator segments rotate to place the first and second applicator segments back in linear alignment; and
(i) removing the web from the corrugating roll and pulling the web straight, wherein the material is stretched and bonded to the web between the peaks.

4,574,023

APPARATUS AND METHOD FOR APPLYING SLEEVES TO PIPE

Neil A. Edwards, Redwood City; James C. Holmes, San Francisco, and Denis I. Wales, Millbrae, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 26, 1984, Ser. No. 574,752
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—187 **15 Claims**



1. An apparatus for wrapping wrapping material on an elongated cylindrical substrate to form a sleeve on the substrate, the apparatus comprising:
(a) at least one guide for placement around the circumference of the substrate and holding means for securely holding the guide in place around the substrate so that (i) the guide is in plane perpendicular to the longitudinal axis of the substrate, (ii) the guide is immovable axially on the substrate, and (iii) the guide is immovable circumferentially around the substrate; and
(b) a wrapping material dispenser comprising (i) means for supporting a roll of the wrapping material so that the wrapping material can be dispensed from the roll, (ii) at least one roller for pressing dispensed wrapping material against the substrate, and (iii) tracking means for tracking the guide around the substrate for dispensing wrapping material around the pipe to provide a sleeve, any overlapping portions of the sleeve being substantially coincident.

7. A method for forming a sleeve on an elongated cylindrical substrate comprising the steps of:
(a) placing a pair of guides around the circumferential periphery of the substrate with the guides parallel to each other and spaced apart;
(b) selecting a dispenser comprising (i) means for supporting roll of wrapping material so that the wrapping material can be dispensed from the roll, (ii) at least one roller for

pressing dispensed wrapping material against the substrate, and (iii) tracking means for tracking the guide around the substrate;

(c) securing the guides to the substrate so that the guides are in a plane perpendicular to the longitudinal axis of the substrate and so the guides are (i) immovable axially on the substrate and (ii) immovable circumferentially around the substrate; and

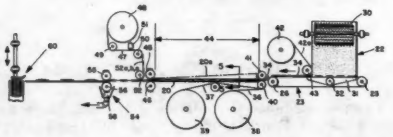
(d) moving the dispenser around the circumference of the substrate with the tracking means tracking the guides to provide a sleeve, any overlapping portions of the sleeve being substantially coincident.

4,574,024

APPARATUS AND METHOD OF MANUFACTURING HYGIENIC DISPOSABLE PADS

G. P. VanMalderen, Buggenhout, Belgium, assignor to Ontex PVBA, Buggenhout, Belgium

Filed Feb. 27, 1984, Ser. No. 583,891
Int. Cl.[4] B32B *31/10*
U.S. Cl. 156—202 **9 Claims**



1. Apparatus for automatically and continuously preparing hygienic disposable pads comprising:

A. forming mean for fomeing fluff into a definitive shape, said forming means being a continuous belt with recessed mesh portions defining a desired shape at spaced intervals;

B. fluffer and metering means associated with said forming means, said fluffer and metering means being capable of grinding paper sheet material into fluff and delivering a metered amount of fluff onto said mesh portions of said forming means; said forming means having an associated vacuum source beneath said mesh portions;

C. drive means capable of effecting continuous travel of said forming means in a predetermined path past said fluffer and metering means;

D. supply means for supplying three strips of sheet material;

E. guide means for guiding the strips from said supply means to define a double layer on the bottom of the fluff and one layer on the top;

F. powered means capable of effecting continuous travel of the shaped fluff and strips past a plurality of operation-performing stations;

G. folding means cooperating with the movement of said powered means and the fluff and strips carried thereon for folding the sides of the bottom sheet material onto the top layer;

H. crimping means for crimping the end portions so as to form a package with said fluff and strips;

I. means for simultaneously applying at least three stripes of adhesive material and a protective layer over the folded portion under compression so as to cause one of said adhesive stripes to penetrate the outermost layer and adhere the folded portions and form a closed package; and

J. means for severing the end portions so as to form individual package units.

7. A method for continuously preparing hygienic disposable pads comprising:

A. forming fluff having a definitive shape on a recessed meshed forming means comprising an endless belt having spaced mesh portions;

B. grinding paper sheet material into fluff and delivering a metered amount of fluff onto said forming means while similtaniously passing the mesh portion over a suction source so as to compact said fluff;

C. effecting continuous travel of said forming means in a predetermined path;

D. supplying three strips of sheet material wherein at least one of said strips is non-woven;

E. guiding the strips to define a double layer on the bottom of the shaped fluff wherein said non-woven strip is the outermost layer and one layer on the top;

F. effecting continuous travel of the shaped fluff and strips past a plurality of operation-performing stations;

G. folding the sides of the bottom sheet material onto the top layer;

H. crimping the end portions so as to form a package with said fluff and strips;

I. simultaneously applying at least three stripes of adhesive material and a protective layer over the folded portions under compression so as to cause one of said adhesive stripes to penetrate the outermost layer and adhere the folded portions and form a closed package;

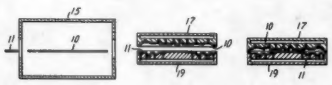
J. severing the end portions so as to form individual package units.

4,574,025

METHOD OF FORMING AN END PANEL FOR A BUILDING AND DOOR UNIT

Phillip R. Juaire, Brooklyn Center; Fredric M. Wagner, Rogers, and Leo F. Wildgen, Bloomington, all of Minn., assignors to Satellite Industries, Inc., Minneapolis, Minn.

Filed Dec. 29, 1983, Ser. No. 566,582
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—245 **4 Claims**



1. The method of forming a wall for a building in which a door is mounted comprising the steps of

forming a first panel in a mold,

forming a mating second panel in a mold,

placing said molded panels in mating engagement while said panels are heated at a temperature to bond said panels at areas of mating engagement,

cooling said bonded panels to define a rigid structure,

cutting a central section from said rigid structure along an area where said panels were bonded together to define at least three edges of a door,

cutting the remaining portion of said rigid structure from said central cut area to an edge of said rigid structure where said panels were bonded to cut said remaining portion into two sections,

sliding the sections together along the last-mentioned cutting to overlap said sections along the cut edges, and

joining said sections at said overlap to move opposite edges of said sections remaining upon cutting said central section to form a frame for said central section defining the door.

4,574,026

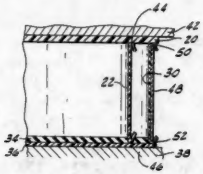
DAMPED WATERBED MATTRESS AND METHOD FOR MANUFACTURING SAME

Howard A. Winther, Union City, Calif., assignor to Royal Waterbeds, Inc., Ellisville, Mo.

Filed Jan. 3, 1984, Ser. No. 567,466
Int. Cl.[4] B29C *65/04*
U.S. Cl. 156—274.4 **3 Claims**

1. A method for manufacturing a damped waterbed comprising the steps of:

(a) applying a first pliant elastomeric sheet to a flat supporting base;
(b) laying at least one second pliant elastomeric sheet upon said first sheet;
(c) providing at least one first die, said first die having a first margin, a second margin, and an inside surface margin adjoining said first margin and said second margin, and an outside surface margin;
(d) fitting a first loop of a third sheet to cover said first margin, said inside surface margin, and said second margin;
(e) placing said first die upon said second sheet such that said third sheet abuts said second sheet along said first margin;
(f) placing a fourth pliant elastomeric sheet upon said first die such that said third sheet abuts said fourth sheet along said second margin;
(g) bonding said second sheet to said first sheet and to said third sheet along said first margin;



(h) bonding said third sheet to said fourth sheet along said second margin thereby to form a first chamber of said fourth sheet, and second sheet and said third sheet attached to a first sheet;
(i) collapsing said chamber through said inside surface for removing said first die from said supporting base;
(j) placing a second die around each said first chamber, said second die having an inwardly disposed surface margin joining a third margin and a fourth margin, and said second die being provided with a band of a fifth pliant elastomeric sheet along said inwardly disposed surface margin and covering said third margin and said fourth margin, said third margin abutting said first sheet;
(k) placing said forth sheet upon said fourth margin abutting said fifth sheet;
(l) bonding said first sheet to said fourth sheet along said third margin; and
(m) bonding said fourth sheet to said fifth sheet along said fourth margin.

4,574,027

DEVICE FOR AFFIXING ADHESIVE LABELS TO OBJECTS

Hübert Weinündbrot, Hechingen-Stein, Fed. Rep. of Germany, assignor to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Balingen, Fed. Rep. of Germany

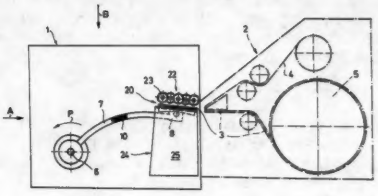
Filed Dec. 30, 1983, Ser. No. 567,352

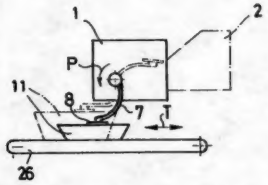
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301439

Int. Cl.[4] B32B *31/00;* **G05G** *15/00;* **B44C** *1/00;* **B31F** *5/00*

U.S. Cl. 156—352 **11 Claims**

1. Device for attaching adhesive labels to objects comprising a labelling arm, which is rotatably mounted and driven by a motor, and a suction head mounted on the free end of said arm, said suction head being connected to a vacuum source via a hollow suction tube for the purpose of drawing a label by suction onto the suction head, characterized in that the hollow suction tube forms the labelling arm supporting the suction head, the tube forming the labelling arm and supporting the suction head is formed from an elastically bendable material, the end of the tube opposite the end bearing the suction head is rotatable about an axis of rotation, the motor rotates the tube





about said axis in a single direction, and the suction head also consists of a bendable elastic material.

4,574,028

APPARATUS FOR PRODUCING A CORRUGATED SHEET

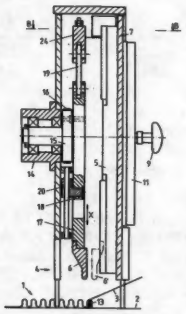
Otto J. Hofer, Schaan, Liechtenstein, assignor to Interrondo AG, Grabs, Switzerland

Filed Jan. 24, 1984, Ser. No. 573,411

Claims priority, application Switzerland, Feb. 10, 1983, 741/83

Int. Cl.[4] B31F *1/20*

U.S. Cl. 156—462 **8 Claims**



1. Apparatus for producing a corrugated element comprising means defining a path along which a carrier web and a superposed top web are to be fed longitudinally and a cyclically operating shaping station extending transversely across said path for forming corrugations in the top web, said shaping station including at least two vertically reciprocable pressing devices extending transversely over said path for impressing corrugations in the top web, at least two separate guide means allocated respectively to said pressing devices for guiding them in their vertical reciprocation, means for reciprocating said pressing devices in said guide means, said guide means being mounted for displacement relative to each other and to a plane extending transversely with respect to said path, and

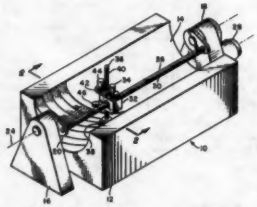
adjusting means for independently adjusting the position of said guide means relative to said plane and to each other, said guide means interacting with said pressing devices such that the displacement of the guide means relative to the transversely extending plane results in a corresponding displacement of said pressing devices relative to each other and said transversely extending plane.

4,574,029

APPARATUS FOR FORMING CONCAVE TAPE WRAPPED COMPOSITE STRUCTURES

William J. Murray, Midlothian, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Apr. 27, 1984, Ser. No. 604,490
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—500 **23 Claims**



1. An apparatus for manufacturing concave composite tape structures comprising:

a mold having a concave surface;

at least one mounting plate rotatably mounted at one end of said mold, said mounting plate mounted for rotation about a point on a longitudinal axis of said concave surface;

a longitudinal shaft mounted to said at least one mounting plate, said longitudinal shaft mounted to a point on said at least one mounting plate which is displaced a selected distance from said longitudinal axis of said concave surface;

a tape dispenser carriage movably mounted to said longitudinal shaft;

a movable radial shaft mounted to said tape dispenser carriage, said radial shaft mounted said selected distance from said longitudinal shaft wherein the longitudinal axis of said radial shaft extends through said longitudinal axis of said concave surface; and

a composite tape dispenser mounted to said radial shaft for applying composite tape to said concave surface.

4,574,030

APPARATUS FOR DISPENSING TAPE HAVING A PROTECTIVE BACKING

Henry D. Pilcher, 123 N. Pointe Dr., Auburndale, Fla. 33823

Filed Jan. 16, 1984, Ser. No. 571,362
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—522 **8 Claims**

1. A portable dispenser for adhesively-coated tape or the like of the type having a protective backing, said dispenser comprising:

(a) a frame having opposing and generally parallel panels, said frame defining a dispensing opening;

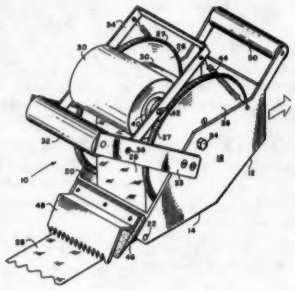
(b) a dispensing reel of an adhesively-coated tape having a protective backing;

(c) a rod for supporting said dispensing reel between said opposing panels spaced from said dispensing opening for rotatably supporting said reel;

(d) rub-out means on said frame for urging said tape against a surface to which said tape is to be affixed as said tape passes along a directed path through said dispensing opening;

(e) a take-up roller supported by said frame;

(f) a forward handle affixed to said panels and extending beyond said dispensing reel;



(g) a swing arm rotatably pinned at one end to said handle and supporting said take-up roller; and

(h) means at the other end of said swing arm for biasing said take-up roller toward said dispensing reel.

4,574,031

ADDITIVE PROCESSING ELECTROLESS METAL PLATING USING AQUEOUS PHOTORESIST

John K. Dorey, II, Ewing Township, Mercer County, N.J.; James T. Huneke, Lower Makefield Township, Bucks County; Bruce S. Madsen, Nockamixon Township, Upper Bucks County, both of Pa., and Theodore F. Schaaf, Lawrence Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Mar. 29, 1985, Ser. No. 717,813
Int. Cl.[4] B44C *1/22*; C03C *15/00*; B05D *5/12*; B29C *17/08*
U.S. Cl. 156—655 **10 Claims**

1. A method for making a printed circuit including the steps of:

(a) applying a photoresist mask to the surface of a substrate to delineate the desired pattern, said photoresist being soluble in an aqueous alkaline solution of pH >10;

(b) treating the substrate with a chromic acid solution so as to etch the exposed substrate surface;

(c) washing the substrate in a reducing media having a pH of $\leqq 10$ so as to reduce and remove chrome from the surface;

(d) catalyze the surface of the substrate; and

(e) electrolessly deposit a thin flash metal deposit from a hypophosphite type flash electroless plating solution.

4,574,032

PROCESS FOR DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL IN THE PRESENCE OF ANTHRAQUINONE IN SOLUTION WITH WHITE AND BLACK LIQUORS

Michael B. Ringley, Charleston Hgts., S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 84,930, Oct. 15, 1979, abandoned. This application Mar. 18, 1982, Ser. No. 359,202
Int. Cl.[4] D21C *3/02, 3/20, 3/26, 11/00*
U.S. Cl. 162—38 **3 Claims**

1. In the process for the delignification of lignocellulosic material by

(a) treating the lignocellulosic material in a closed reaction vessel with a kraft pulping liquor containing from 0.001% to 10.0% by weight, based on the lignocellulosic material, of anthraquinone, the treatment taking place at a maximum temperature of from 150° C. to 200° C. for a period of from 0.5 to 480 minutes,

(b) discharging the pulping liquor from the lignocellulosic material, and

(c) washing the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain a delignified cellulosic material,

a preliminary step consisting essentially of introducing the anthraquinone into the vessel in solution first formed by combining the anthraquinone with a mixture consisting of from 10% to 50% by volume white liquor and, correspondingly, from 90% to 50% by volume black liquor, wherein the volume percentages are based on the total volume of the white liquor-black liquor mixture.

4,574,033

METHOD AND APPARATUS FOR DELIVERING A MULTILAYER JET OF STOCK TO A FORMING SURFACE IN A PAPERMAKING MACHINE

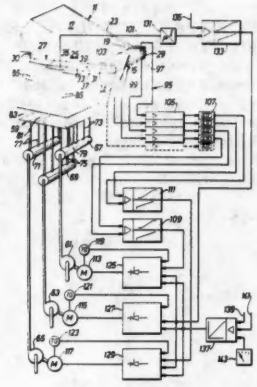
Harry I. Myrén, Karlstad, Sweden, assignor to KMW Aktieboiag, Karlstad, Sweden

Filed Jun. 22, 1983, Ser. No. 506,380

Claims priority, application Sweden, Jul. 6, 1982, 8204166

Int. Cl.[4] D21F *1/02*

U.S. Cl. 162—198 **8 Claims**



1. In a method of delivering a multilayer stock jet to a forming surface in a papermaking machine with a multilayer headbox having a slice chamber formed by side walls and top and bottom walls terminating in lip members defining a slice opening and at least one relatively rigid stock separating partition dividing said chamber into separate slice channels, said partition being fixed at its upstream end and having one side attached to the adjacent side wall at a point downstream of and at a distance from said upstream end and the other side attached to the adjacent opposite side wall at a point downstream of and at a distance from said upstream end so as to be free of play in a direction perpendicular to the plane of the partition, in which separate papermaking stocks are fed by separate pumps through said slice chamber channels and discharged through said slice opening to the forming surface, the improvement comprising detecting any deviation from a straight line of the run of said partition between said points where it is attached to the side walls of the slice chamber, produced by difference in pressure in the papermaking stock flowing through said slice channels, and adjusting the pressure in at least one of said slice channels to reduce the magnitude of said deviation to a negligible amount.

2. In apparatus for delivering a multilayer jet of papermaking stock to a forming surface, comprising a multilayer headbox having side walls and top and bottom lip members defining a slice chamber converging to a slice opening, at least one relatively rigid partition in the headbox extending from side wall to side wall and at least up to the slice opening and dividing the slice chamber into separate slice channels, said partition being fixed at its upstream end and having one side attached to the adjacent side wall at a point downstream of and at a distance from said upstream end and the other side attached to the adjacent opposite wall at a point downstream of and at a distance from said upstream end so as to be free of play in a direction perpendicular to the plane of the partition, and at least first and second pumps for supplying separate papermaking stocks to said respective slice channels, the improvement comprising means for detecting any deviation from a straight line of the run of said partition between said points where it is attached to the side walls of the slice chamber, produced by difference in pressure in the papermaking stock flowing through said slice channels, and means responsive to any said deviation for adjusting the pressure in said slice channels so as to reduce said deviation to a negligible amount.

4,574,034

METHOD FOR MONITORING THE REVERSAL SYSTEM OF COKE OVEN BATTERIES

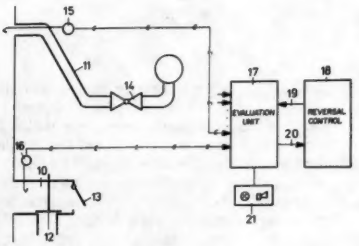
Otto Lemke; Dieter Stalherm, both of Recklinghausen, and Reimer Haack, Haltern-Lavesum, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,790

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305871

Int. Cl.[4] C10B *21/10*

U.S. Cl. 201—1 **3 Claims**



1. A method of monitoring the reversal system of regenerative operations in a coke oven battery, said coke oven battery having a plurality of coke ovens with a plurality of air and waste heat valves and a plurality of rich gas supply ducts each with a rich gas reversal valve, comprising separately measuring the temperature in each air and waste heat valve during the flow of waste heat and during the flow of air, comparing each of the measured temperatures with desired values for the flow of waste heat and the flow of air respectively and, upon an undue deviation of any of the measured values from the desired values, generating control signals which indicate the failure of at least one air and waste heat valve from operating correctly during a regenerative operation.

4,574,035

WARP-RESISTANT SELF-SEALING COKE OVEN DOOR

Robert W. Highley, 1802 W. 159th Ave., Crown Point, Ind. 46307, and Stephen J. Stanczak, 9135 S. Western Ave., Chicago, Ill. 60620

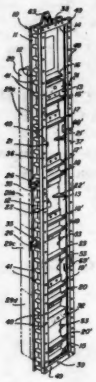
Filed Nov. 15, 1984, Ser. No. 671,627

Int. Cl.[4] C10B *25/02, 25/06, 25/16*

U.S. Cl. 202—242 **11 Claims**

1. A fabricated coke oven door having a reinforcing warp-resistant construction for maintaining a long-lasting sealing engagement with a generally rectangular opening of a coking chamber comprising: a rigid door plate dimensioned to overlie the opening of a coking chamber, elongated rectangular spaced longitudinal stiffener plates extending substantially the

length of said door plate and secured to the outer side of the door plate, rectangular transverse stiffener plates secured to the ends of said longitudinal stiffener plates, said stiffener plates spaced from the longitudinal and transverse edges of the door plate and having the wide sides thereof disposed perpendicular to the outer surface of the door plate, a plurality of transverse braces connecting said longitudinally extending stiffener plates at spaced intervals along the length of the longitudinal stiffener plates and said transverse braces being secured to said door plate, each said stiffener plate having secured to the outer end thereof a rectangular bar of like length



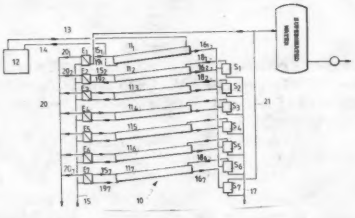
with each of said rectangular bars extending laterally outwardly to about the edge of said door plate in a plane parallel with the plane of the door plate, spring box means fixedly disposed between the lower surface of said rectangular bars and said door plate forming a reinforcing rigid framework with said door plate, and said spring box means adapted to co-act through apertures in said door plate with sealing means which is mountable on the inner surface of said door plate to form a sealing engagement between said oven door and a door frame of said coking chamber when said oven door is operatively mounted on said coking chamber.

4,574,036

METHOD AND AN INSTALLATION FOR PURIFYING INDUSTRIAL WASTE WATER, PARTICULARLY PROCESS WATER FROM DYEING WORKS

Pierre A. Henriot, St. Dié , France, assignor to Ets. Ch. Scareder & Fils, Saint-Dié , France

Filed Jan. 17, 1983, Ser. No. 458,353
Int. Cl.[4] B01D *1/26*; C02F *1/04*
U.S. Cl. 203—39 **7 Claims**



1. A method of purifying polluted industrial waste water having a high chemical demand for oxygen and fine particles in suspension, the method comprising the steps of:

directly heating and evaporating the polluted water to produce a mixture of water vapor and sludge without first subjecting it to mechanical separation by sieving or decanting;

separating sludge from the water vapor; condensing the water vapor;

subjecting the condensed water vapor to a coagulation-flocculation chemical purifying process; and

filtering the purified condensed water vapor.

5. An apparatus for purifying polluted industrial waste water having a high chemical demand for oxygen and fine particles in suspension, wherein the apparatus comprises:

an outlet pipe for conveying waste water from an industrial process,

an evaporator directly connected to the outlet pipe conveying waste water,

a separator connected to receive a mixture of vapor and sludge from the evaporator to separate sludge therefrom,

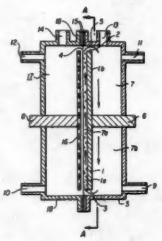
a coagulation-flocculation means for treating the water vapor in a condensed state, and a filter means for receiving treated water from the coaggulation-flocculation means.

4,574,037

VERTICAL TYPE ELECTROLYTIC CELL AND ELECTROLYTIC PROCESS USING THE SAME

Yasushi Samejima, Kakogawa; Minoru Shiga, Himeji; Toshiji Kano, Kakogawa; Koji Saiki, Toyonaka, and Tsutomu Nishio, deceased, late of Kakogawa, all of Japan (by Haruko Nishio, legal representative), assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1983, Ser. No. 566,931
Claims priority, application Japan, Apr. 12, 1983, 58-64324
Int. Cl.[4] C25B *1/46*
U.S. Cl. 204—98 **15 Claims**



14. A process for electrolyzing an aqueous solution of an alkali metal halide which comprises (1) generating a cathode gas in a cathode gas generating room of a vertical type electrolytic cell partitioned by an ion exchange membrane into an anode compartment and a cathode compartment, said cathode compartment being divided by a non-perforated cathode plate into a cathode gas generation room and a cathode gas separation room, whereby a catholyte is caused to flow upward in the cathode gas generation room in a mixed stream of the catholyte and the cathode gas by the action of a gas lift effect produced by the cathode gas, (2) introducing said mixed stream into said cathode gas separation room through an opened portion provided near the uppermost part of said cathode plate, (3) separating the catholyte from the cathode gas, whereby the resulting catholyte has a smaller gas content than the mixed stream in the cathode gas generation room, then (4) introducing said resulting catholyte into said cathode gas generation room through an opened portion provided near the lowermost part of said cathode plate, whereby a circulating flow of catholyte is allowed to take place between said cathode gas generation room and said cathode gas separation room through said opened portions provided near the uppermost and lowermost parts of said cathode plate.

4,574,038

MICROWAVE INDUCED CATALYTIC CONVERSION OF METHANE TO ETHYLENE AND HYDROGEN

Jeffrey K. S. Wan, Kingston, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Aug. 1, 1985, Ser. No. 761,394
Int. Cl.[4] B01J *19/12*; C07C *2/00*
U.S. Cl. 204—162 R **5 Claims**

1. A process for converting methane to ethylene and hydrogen comprising:

providing methane in a reaction zone containing a catalyst, said catalyst being capable of absorbing microwave radiation;

irradiating the methane in the presence of said catalyst with pulsed microwave radiation for a sufficient period of time, to thereby convert methane to ethylene and hydrogen; and

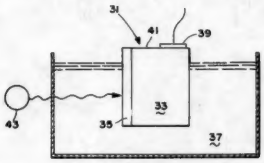
recovering said reaction products.

4,574,039

PHOTOCORROSION RESISTANT SEMICONDUCTOR PHOTOELECTRODES

Stephen C. Pyke, Willowick, and Mark R. Bruce, Berea, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Sep. 24, 1984, Ser. No. 653,415
Int. Cl.[4] C25B *11/04*
U.S. Cl. 204—290 R **10 Claims**



1. A semiconductor photoelectrode resistant to photocorrosion, said photoelectrode comprising a semiconductor body having at least one outside surface and a silicon dioxide layer on said at least one outside surface of said body for receiving illumination, wherein said silicon dioxide layer is doped with metal atoms of at least one of the group of tantalum, vanadium, titanium, and niobium.

4,574,040

APPARATUS FOR VERTICAL GEL ELECTROPHORESIS

Timothy E. Delony, San Leandro, and Daniel Y. M. Chu, San Francisco, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

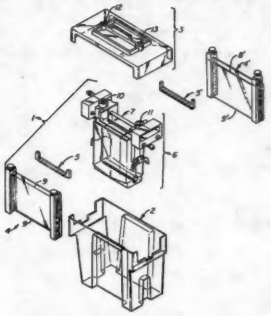
Continuation-in-part of Ser. No. 601,193, Apr. 17, 1984, abandoned. This application Sep. 26, 1984, Ser. No. 655,001
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R **18 Claims**

1. Apparatus for performing electrophoresis across at least one vertical gel, comprising:

a lateral enclosure for said vertical gel open at the top and bottom and extending upward at one side to a height sufficient to form a liquid-retaining wall;

a U-shaped frame combinable with one said lateral enclosure at each side thereof to form a liquid-retaining receptable defined by said U-shaped frame and one said liquid-retaining wall from each said lateral enclosure, the interior thereof communicating with the open top of each said lateral enclosure;

a pin on one of said lateral enclosure and said U-shaped frame and a guide for said pin on the other of said lateral enclosure and said U-shaped frame, said pin and guide in cooperating relationship to slide said lateral enclosure into pivotal contact with said U-shaped frame; and



a lug on one of said lateral enclosure and said U-shaped frame and a releasable catch for said lug on the other of said lateral enclosure and said U-shaped frame to secure said lateral enclosure against said U-shaped frame.

4,574,041

METHOD FOR OBTAINING A SELECTIVE SURFACE FOR COLLECTORS OF SOLAR AND OTHER RADIATION

Joseph Zahavi, Haifa, and Shoshana Tamir, Tirat-Hacarmel, both of Israel, assignors to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Aug. 16, 1984, Ser. No. 641,253
Claims priority, application Israel, Aug. 16, 1983, 69507
Int. Cl.[4] C25D *5/18, 5/48*; G02B *1/10*
U.S. Cl. 204—38.3 **8 Claims**

1. A method for obtaining a selective surface for thermal, and particularly solar, radiation collectors which comprises the steps of:

(a) anodizing by alternating current in a density range of between 5 to 60 A/dm^2 a zinc-coated metal plate of a thickness in the range of between 2μ to 30μ, said plate being immersed in an alkaline bath containing between 2 to 30 g/l OH^-, and

(b) passivating said anodized plate in an acidic bath containing more than 2 g/l H^+.

4,574,042

GAS ANALYZING APPARATUS

Hideo Shiraishi, Yokohama, Japan, assignor to Fuji Electric Corporate Research & Development Co., Ltd., Yokosuka, Japan

Filed Feb. 3, 1984, Ser. No. 576,636
Claims priority, application Japan, Feb. 14, 1983, 58-21727
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—429 **5 Claims**

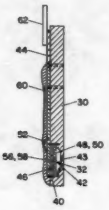
1. A gas analyzing apparatus comprising:

a planar insulating ceramic substrate having multistage grooves in a major surface thereof forming a cavity and a relatively small aperture extending from a surface of the substrate to an interior surface of the cavity;

an electrolytic disc mounted within the grooves so that the cavity is closed to form a gas analyzing compartment, wherein when the apparatus is placed in a region having an oxygen containing gaseous mixture to be analyzed, the gas analyzing compartment is in communication with the region through the aperture such that the gaseous mixture diffuses into the gas analyzing chamber at a relatively slow rate;

at least one pair of metallic electrodes formed on opposing

major surfaces of the electrolytic disc, the electrodes being formed in a manner so as to allow any oxygen in the gas analyzing compartment to contact at least a portion of the major surface of the electrolytic disc within the gas analyzing compartment and to allow any oxygen withdrawn through the electrolytic disc to pass through at least a portion of the other major surface thereof;



means for coupling at least one pair of the electrodes to a source of electrical charge, wherein the oxygen content of the gaseous mixture is determined by the quantity of electrical charge supplied to the electrodes coupled to the source of electrical charge.

4,574,043

CATALYTIC PROCESS FOR MANUFACTURE OF LOW POUR LUBRICATING OILS

Arthur W. Chester, Cherry Hill; William E. Garwood, Haddonfield, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,060

Int. Cl.[4] C10G *45/62, 45/64, 65/12*

U.S. Cl. 208—59 **13 Claims**

1. A process for hydrodewaxing a petroleum fraction having a boiling point above about 550° F., to produce a dewaxed lubricating oil base stock, comprising

contacting a feedstock of said petroleum fraction, in the presence of hydrogen, with a supported catalyst composition comprising, in combination, about 20 to about 50 percent by weight of a support material; about 0.1 to about 3 weight percent of at least one Group VIII metal; the remainder being a porous crystalline silicate having a silicon to aluminum mole ratio, expressed in terms of the mole ratio of SiO_2 to Al_2O_3, of at least about 20, characterized by an X-ray diffraction pattern which is at least substantially identical to that of Table A, designated herein ZSM-22, wherein contact of said feedstock with said supported catalyst is undertaken under conditions including a pressure of from about 200 psig to about 3000 psig; a temperature of from about 260° C. to about 482° C.; a feedstock LHSV ranging from about 0.2 to about 20 and from about 500 and up to about 20,000 standard cubic feet of hydrogen per barrel of feedstock.

4,574,044

METHOD FOR SPENT CATALYST TREATING FOR FLUIDIZED CATALYTIC CRACKING SYSTEMS

Russell R. Krug, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

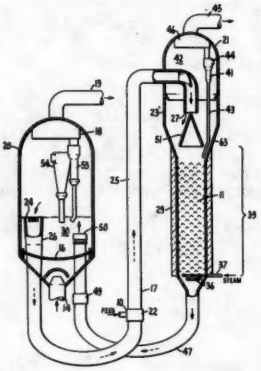
Continuation-in-part of Ser. No. 363,946, Mar. 31, 1982, abandoned. This application May 8, 1984, Ser. No. 608,229

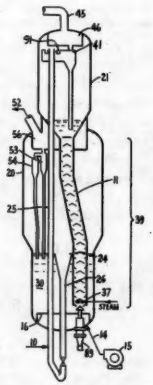
Int. Cl.[4] C10G *11/05, 11/18;* B01J *29/38, 38/06*

U.S. Cl. 208—120 **10 Claims**

1. In a fluid catalytic cracking process wherein the hydrocarbon feed contacts a crystalline zeolitic cracking catalyst for not longer than 10 seconds in a reaction zone and thereafter said catalyst is separated from the relatively dispersed phase of said reacting mixture of heated catalyst and hydrocarbon vapors, the resultant dense phase of spent catalyst is stripped of entrained or adsorbed hydrocarbon vapors by passing flowing steam through said dense phase before return of the resulting stripped catalyst which is essentially free of volatile hydrocarbons but containing residual nonvolatile hydrocarbons as coke, to a regenerator for oxidative regeneration including oxidation of said coke and recirculation of the resultant heated and regenerated catalyst for contact with additional hydrocarbon feed, the improvement comprising

subjecting said dense phase of spent crystalline zeolitic catalyst after said normal steam stripping of hydrocarbon vapors to an additional period of time at substantially the same temperature as in said normal steam stripping step and below about 1000° F. and in the presence of steam,





said steam added in an amount and to an extent during said additional period of time so that steam reacts with coke on the catalyst to form hydrocarbon gas,

said additional period of time being sufficient to modify catalyst and/or coke thereon, whereby upon subsequent oxidative regeneration and recycle of said zeolitic catalyst to the reaction zone there results an increase in conversion when compared to an absence of said additional period of time.

2. The process of claim 1 wherein said additional period of time ranges from ½ to 30 minutes.

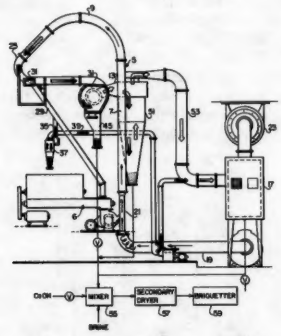
3. The process of claim 1 wherein said additional period of time is 1.2–5 times that of the normal stripping period.

4,574,045

REMOVAL OF UNDESIRABLE SUBSTANCES FROM FINELY DIVIDED PARTICLES

Edward Y. Crossmore, Jr., Box 201, New Bethlehem, Pa. 16242

Continuation of Ser. No. 350,888, Feb. 22, 1982, abandoned.
This application Sep. 10, 1984, Ser. No. 649,147
Int. Cl.[4] B07B 9/02
U.S. Cl. 209—11 16 Claims



1. A method for separating heavy weight, middle weight and light weight solid particles from an admixture of solid particulate substances containing same which comprises

(i) heating and drawing a conveying gas through a closed separation system comprising a series of three separation stages all in communication with each other;

(ii) prior to said first separation stage, contacting said heated conveying gas with said admixture with solid particulate substances having a mesh size of minus 30 to minus 250 and introducing said conveying gas and admixture of solid particulate substances into an elongated vertical heating duct having a curved section at the upper end so as to remove surface moisture from said particulate substances;

(iii) drawing said heated conveying gas with said dried admixture of particles through the curved section of said elongated heating duct at a flow rate and a solids to heated conveying gas loading that produces a laminar flow wherein heavy weight particles are positioned as a lamina in a different segment of the duct than the remaining middle weight and light weight particles by centripetal force induced therein;

(iv) drawing the laminar flow of particles through said first separation stage where the dried particles are passed through a first elbow-shaped duct;

(v) splitting away said heavy particle lamina from said remaining middle and light weight particle laminae by a first adjustable splitting means comprising a movable deflector positioned within said elbow-shaped duct;

(vi) drawing additional air into said first elbow-shaped duct via an adjustable air inlet means located ahead of said splitting means for controlling the degree of centripetal force generated at the first separation stage;

(vii) drawing the remaining middle and light weight particles to said second separation stage where the particles are passed through a second elbow-shaped duct to produce a laminar flow wherein middle weight particles are to be separated from the remaining particles positioned as laminae in different segments of the duct by centripetal force induced therein;

(viii) splitting away some of said middle weight particles as a lamina by a second adjustable splitting means comprising a movable deflector positioned within said second duct;

(ix) drawing the remaining middle and light weight particles into a circular duct wherein a centripetal force is induced to create a lamina of middle weight particles not separated in step (vii);

(x) splitting away more of the middle weight particles in the lamina created in step (ix) by a third adjustable splitting means comprising a movable deflector position within said circular duct; and

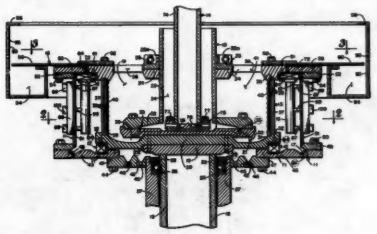
(xi) drawing the remaining particles to said third separation stage comprising a cyclone separator wherein light weight particles are separated as a cyclone overflow from remaining middle weight particles separated as a cyclone underflow.

4,574,046

CENTRIFUGAL JIG FOR ORE BENEFICIATION

Earnest A. Sprow, E. 8620 - 44th Ave., Spokane, Wash. 99206

Filed Sep. 21, 1984, Ser. No. 653,029
Int. Cl.[4] B03B 5/20
U.S. Cl. 209—44 10 Claims



1. A centrifugal jig for separating a more dense fraction from a less dense fraction of particulate pulp material comprising:

a hutch peripherally defining a chamber;

a vertical rotor journaled for rotation in the hutch and having an upper rotor plate and a lower rotor plate, said hutch and said lower plate constructed and arranged for substantial containment of fluidic media therein;

means for rotating the rotor;

a cylindrical jig screen defining the periphery of a jigging chamber carried within the hutch by the rotor for coaxial rotation therewith;

input means for directing particulate pulp material into the jigging chamber and onto the lower inner surface of the cylindrical jig screen;

plural pulsing means spacedly positioned about the periphery of the jig screen, each pulsing means directing a continuous stream of pressurized air to and through the jigging screen at spaced positions to pulse the material on the jig screen at each such spaced position as the jig screen rotates past each position so that the jigged particles have adaquate space to expand into so that they do not substantially interfere with each other;

tailings collection means to receive the less dense fraction of the particulate pulp material from the top of the jig screen for exhaustion; and

concentrate collection means in the lower portion of the hutch to receive for collection the more dense fraction of particulate pulp material that passes through the jig screen and into the hutch.

7. The method for separating a more dense fraction from a less dense fraction of particulate pulp material, comprising the steps of:

introducing a slurry of pulp material into a jigging chamber, having a cylindrical peripheral jig screen defining a jig bed on its inner surface and surrounded by a fluidic media;

rotating the peripheral jig screen about its axis at a velocity sufficient to cause centrifugal loading on the jig bed substantially in excess of the force of gravity and to cause rotation in the fluidic media and particulate matter therein

to move that particulate matter radially outwardly to the jigging bed supported on the jig screen;

simultaneously jigging the pulp material in the rotating cylindrical jig bed by directing pressurized gas radially inwardly therethrough at plural peripherally spaced positions thereabout to cause the jig bed at said spaced positions to expand inwardly and thereafter at least partially collapse outwardly as it moves past the areas of pressurized gas impingement;

collecting a heavier fraction of particulate matter radially outwardly of the jigging screen; and

removing a lighter fraction of particulate matter from the upper portion of the jigging screen.

4,574,047

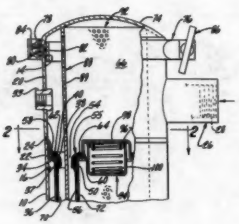
FILTERING DEVICE

Borje O. Rosaen, 4031 Thornoaks, Ann Arbor, Mich. 48104

Division of Ser. No. 549,246, Nov. 4, 1983, Pat. No. 4,496,459. This application Aug. 6, 1984, Ser. No. 638,126

Int. Cl.[4] B01D *27/10*

U.S. Cl. 210—130 **2 Claims**



1. A fluid filtering device comprising:

an elongated housing having an open top, an interior wall and defining an interior chamber,

said housing having an inlet and an outlet open to said chamber,

a first elongated and tubular strainer secured to said housing within said chamber so that said first strainer is spaced inwardly from said interior wall of said housing,

a second elongated and tubular strainer contained within and spaced inwardly from said first strainer,

means for securing said strainers together at their ends most spaced from said open end of said housing,

a filter assembly removably insertable between said strainers through said open housing top whereupon said filter assembly is positioned between said inlet and said outlet said filter assembly comprising a toroidal filter bag having an outer periphery and an inner periphery,

means for securing the outer periphery of said bag to the end of said first strainer closest to said open housing top,

means for securing the inner periphery of said bag to the end of said second strainer closest to said open housing top,

a cover, and

means for detachably securing said cover across said open end of said housing.

4,574,048

VACUUM FILTER SYSTEM FOR SWIMMING POOLS

William A. van den Broek, Doylestown, Pa., assignor to KDI Sylvan Pools, Inc., Doylestown, Pa.

Continuation-in-part of Ser. No. 453,233, Dec. 27, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,872

Int. Cl.[4] B10D *35/00*; E04H *3/16*

U.S. Cl. 210—136 **4 Claims**

1. A vacuum filter system for filtering water in swimming pools which comprises

at least one suction pipe line connection to a swimming pool to remove water for filtering from said swimming pool,

a closed vacuum filter tank for filtering water having an inlet and an outlet,

said suction pipe line connected to said inlet of said filter tank,

said filter tank is of separable two piece construction, including an upper half and a lower half,

clamp means for retaining said tank halves in assembled condition,

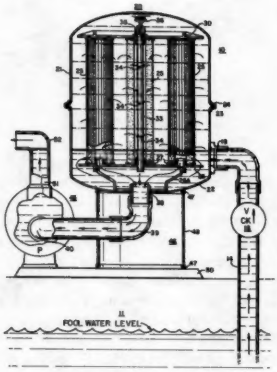
said bottom tank half has a lower retainer plate engaged with and supported therein,

said lower retainer plate has a plurality of hollow projections spaced therearound,

a plurality of filter cartridges carried on said projections and extending vertically upwardly,

an upper retainer plate engaged with said filter cartridges,

a hollow tube carried on a central projection of said lower plate and engaged with said upper retainer plate,



said tube having means defining a plurality of openings,

a removable cap engaged with said tube and retaining said cartridges between said plates,

a vacuum pump having an inlet pipe line connected to said filter tank outlet and a return connection,

said inlet of said vacuum pump in communication with said outlet of said filter tank said vacuum pump having means for controlling the operation of said vacuum in said tank, so that water from said pool flows thereinto, displacing any air therein, until said tank is in a flooded condition,

the air in said tank is pulled downwardly through said tube and below said lower retainer plate,

the water in said tank is forced through said filter cartridges and mixed with said air, which enters the inlet of said vacuum pump, and

at least one return pipe line connected to said pump return connection for returning filtered water to said pool.

4,574,049

REVERSE OSMOSIS SYSTEM

Gregory A. Pittner, Danville, Calif., assignor to Arrowhead Industrial Water, Inc., Los Angeles, Calif.

Filed Jun. 4, 1984, Ser. No. 616,729

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—639 **10 Claims**

1. A water purification process for removing dissolved solids of the type that are normally present in a municipal water supply or the like, which comprises the steps of:

providing a first reverse osmosis unit having an inlet, a product outlet and a brine outlet;

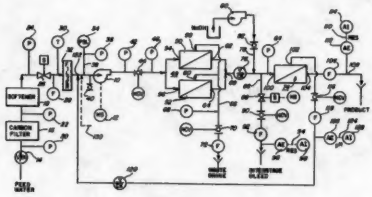
providing a second reverse osmosis unit having an inlet, a product outlet and a brine outlet;

locating said second reverse osmosis unit downstream of

said first reverse osmosis unit with the product outlet of said first reverse osmosis unit being coupled to the inlet of said second reverse osmosis unit;

providing water to be purified to the inlet of said first reverse osmosis unit;

treating the product from said reverse osmosis unit at a



location upstream of said second reverse osmosis unit with a chemical treatment agent comprising a solution having a pH that exceeds 7 to reduce carbon dioxide concentration of the product by chemical conversion and to ionize certain otherwise difficult to remove chemicals; and

directing the product from said second reverse osmosis unit toward a point of use or storage for purified water.

4,574,050

METHOD FOR PREVENTING THE PRECIPITATION OF FERRIC COMPOUNDS DURING THE ACID TREATMENT OF WELLS

Curtis W. Crowe, and Charles M. Maddin, both of Tulsa, Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation of Ser. No. 397,008, Jul. 9, 1982, abandoned, which is a continuation of Ser. No. 131,298, Mar. 18, 1980, abandoned.

This application Jul. 18, 1985, Ser. No. 756,913

Int. Cl.[4] E21B *43/27*

U.S. Cl. 252—8.55 C **9 Claims**

1. A method for preventing the undesirable formation and precipitation of ferric compounds from a spent treatment acid containing dissolved iron following an acidizing treatment of subterranean formations surrounding a wellbore, said method comprising adding to said treatment acid prior to contact with the formation an amount of ascorbic acid and/or erythorbic acid, and/or a soluble salt of said acid, sufficient to prevent the formation and precipitation of ferric compounds from the treatment acid upon spending.

4,574,051

THERMOCHEMICAL ENERGY STORAGE

Andrew J. Matthews, Bournemouth, and Simon A. Thomas, Ringwood, both of England, assignors to Edeco Holdings Limited, London, England

Filed Aug. 3, 1983, Ser. No. 519,995

Claims priority, application United Kingdom, Aug. 12, 1982, 8223256

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 **1 Claim**

1. A thermal energy storage medium consisting essentially of sodium acetate trihydrate and xanthan gum having a concentration in the range of 1 to 5% by weight of the medium.

4,574,052

CRACKLING AEROSOL FOAM

Anil J. Gupte, Seymour, and Joyce M. Kendall, Huntington, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed May 31, 1984, Ser. No. 615,574

Int. Cl.[4] C11D *17/00*; C09K *3/30*

U.S. Cl. 252—90 **20 Claims**

1. An aerosol foam composition producing pronounced and prolonged auditory effects upon discharge from an aerosol container comprising, as percent by weight,

molecular sieve about 16 to about 34%,

surfactant about 1.6 to about 3.4%,

vehicle about 22.4% to about 47.6%,

liquified gas propellant, about 15 to about 60%,

and wherein the vehicle is selected from the group consisting of alkylene glycols, polyalkylene glycols, vegetable oils and mixtures thereof and the liquified gas propellant is selected from the group consisting of liquified hydrocarbon and fluorinated hydrocarbon gases.

4,574,053

SOAP/SYNDET BARS FILLED WITH FATTY ACID COATED REACTIVE FILLER

Donald V. Kinsman, Fort Thomas, and Clement H. Luken, Jr., Highland Heights, both of Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,805

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—134 **23 Claims**

1. A synthetic detergent, a combination of soap and detergent or a soap, each in bar, form comprising particulate filler material capable of reacting chemically with fatty acid wherein the individual particles of said filler are coated with fatty acid that has been reacted with and is chemically bonded to said filler.

4,574,054

MOLECULAR WEIGHT CONTROLLERS COMBINATION FOR CAPROLACTAM POLYMERIZATION PROCESSES

Aldemaro Ciaperoni, Bollate, and Alberto Cappelli, Cogliate, both of Italy, assignors to Snia Fibre S.p.A., Via Friuli, Italy

Filed Dec. 28, 1983, Ser. No. 566,384

Claims priority, application Italy, Dec. 31, 1982, 25075 A/82

Int. Cl.[4] C09K *3/00*; C08G *69/16*

U.S. Cl. 252—188.31 **8 Claims**

1. A combination of polycaprolactam molecular weight controllers to be added to a polymerizable caprolactam composition comprising the following three components:

(a) a monofunctional primary amine having a boiling point equal to or higher than 180° C. at atmospheric pressure, and a basic dissociation constant equal to or higher than 1.7×10^{-5};

(b) a monofunctional organic acid having an acid dissociation constant higher than 1.5×10^{-5}; and

(c) a salified aminoacid containing at least 10 carbon atoms and having the amino groups salified by a monofunctional organic or inorganic acid having an acid dissociation constant higher than 1.0×10^{-2}.

4,574,055

RESISTOR COMPOSITIONS

Eiichi Asada, Tokyo; Toshio Inokuma, Fujisawa, and Mikio Yamazoe, Oume, all of Japan, assignors to Shoei Chemical Inc., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,640

Claims priority, application Japan, Jan. 6, 1984, 59-595

Int. Cl.[4] H01B *1/02, 1/06*

U.S. Cl. 252—514 **8 Claims**

1. A resistor composition comprising conductive particles, a glass frit and a vehicle, said conductive particles comprising particles selected from the group consisting of coated RuO_2 particles and a mixture of said coated RuO_2 particles and uncoated RuO_2 particles wherein the weight ratio of coated RuO_2 particles/uncoated RuO_2 particles is from 5/95 to 100/0, said coated RuO_2 particles having a polynary oxide coating of a metal component selected from the group consisting of (1) Bi and Ru; (2) Pb and Ru; and (3) Bi, Pb and Ru; the weight ratio of said conductive particles to said glass frit being in the range of 60:40 to 5:95.

4,574,056

DIE-BONDING ELECTROCONDUCTIVE PASTE

Shoichi Kimura, Tsukui, Japan, assignor to Kidd, Inc., Kanagawa, Japan

Filed Dec. 5, 1984, Ser. No. 678,246
Claims priority, application Japan, Dec. 16, 1983, 58-236023
Int. Cl.[4] H01B *1/16*
U.S. Cl. 252—514 15 Claims

1. A die bonding electroconductive paste containing at least one element having the same valence as the valence of a semiconductor element to be die-bonded or a compound of said element and a reducing substance selected from the group consisting of metal hydrides, metal carbides, grignard reagents, fatty acids of 12 to 22 carbon atoms, zinc and aluminum lower alkyls of 1–3 carbon atoms, metal salts of naphthenic, acetic and propionic acids, and hydrazine, said paste permitting ohmic contact to be effected between said paste and said semiconductor at a temperature of not less than 100° C.

4,574,057

COMPOSITIONS FOR PRINTING INK VARNISHES

Michael D. Kaza, and Paul S. Sauers, both of Pittsburgh, Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 615,027, May 29, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 784,371
Int. Cl.[4] C08F *216/06*; C09D *11/02, 11/06, 11/10*
U.S. Cl. 260—101 26 Claims

1. A composition comprising:

(a) a predominant amount of dicyclopentadiene; and lesser amounts of

(b) at least one member selected from the group consisting of dimerized aliphatic cyclic and non-cyclic dienes of five carbon atoms; debutanized aromatic concentrates; C-5 olefins; acyclic conjugated C-5 dienes; monoolefins, diolefins, and polyenes each having more than five carbon atoms and having no aromatic rings; and

(c) at least one member selected from the group consisting of tall oil; fatty acid-containing materials and rosin acid containing materials; and

(d) at least one ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride; and

(e) at least one member selected from the group consisting of materials containing two or more reactive groups, at least one of which must be a hydroxyl group.

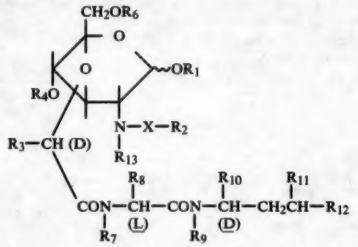
4,574,058

ANTIGEN DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Gerhard Baschang, Bettingen; Felix M. Dietrich, Basel; Roland Gisler, Binningen, all of Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany; Jaroslav Stanek, Birsfelden, Switzerland, and Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 303,244, Sep. 17, 1981, Pat. No. 4,397,844, which is a division of Ser. No. 14,190, Feb. 22, 1979, abandoned. This application Mar. 21, 1983, Ser. No. 477,281
Claims priority, application Switzerland, Feb. 24, 1978, 2035/78; Apr. 7, 1978, 3777/78; May 18, 1978, 5394/78
The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R 15 Claims

1. A muramyl-peptide of the general formula



(II)

in which X is a carbonyl group, R_1, R_4 and R_6 are tri-lower alkyl-silyl, R_2 is unsubstituted or substituted alkyl or carbocyclic aryl, R_3 is hydrogen or alkyl, R_7 and R_{13} are hydrogen or lower alkyl, R_8 is hydrogen, lower alkyl, free, esterified or etherified hydroxy-lower alkyl, free, esterified or etherified mercapto-lower alkyl, free or acylated amino-lower alkyl, cycloalkyl having 5 or 6 carbon atoms, cycloalkyl-lower alkyl, of which the cycloalkyl radical contains 5 or 6 carbon atoms, unsubstituted or substituted aryl or aralkyl, nitrogen-containing heterocyclyl or heterocyclyl-lower alkyl, R_7 and R_8 together can also be alkylene having 3 or 4 carbon atoms, R_9 is hydrogen or lower alkyl, the radicals R_{10} and R_{12} independently of one another are a carboxyl radical which may or may not be esterified or amidised, and R_{11} is hydrogen or a carboxyl radical which may or may not be esterified or amidised.

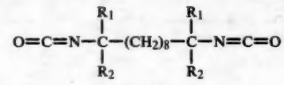
4,574,059

DECANE-1,10-DIISOCYANATES AND METHODS OF MAKING THE SAME

Jacques Kervennal, Lyons, and Pierre Durual, Vernaison, both of France, assignors to ATOCHEM, France

Filed Feb. 27, 1985, Ser. No. 706,319
Claims priority, application France, Mar. 2, 1984, 84 03253
Int. Cl.[4] C07C *119/045, 119/042*
U.S. Cl. 560—347 9 Claims

1. Decane-1,10-diisocyanates corresponding to the formula



wherein R_1 is an alkyl or cycloalkyl radical and R_2 is a hydrogen atom or an alkyl or cycloalkyl radical.

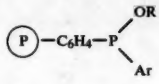
4,574,060

SELECTIVE CONVERSION OF ACRYLONITRILE INTO 1,4-DICYANO-1-BUTENE CATALYZED BY POLYMER-BOUND ALKYL DIARYLPHOSPHINITES

William J. Boyle, Jr., Warren; Frank Mares, Whippany, and Andrea M. Wallo, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 3, 1982, Ser. No. 438,687
Int. Cl.[4] C07C *121/30*
U.S. Cl. 558—457 16 Claims

1. A heterogeneous catalytic process for converting acrylonitrile into 1,4-dicyano-1-butene which comprises contacting a liquid phase comprising acrylonitrile with an effective amount of polymer-bound alkyl diarylphosphinite catalyst which is solid under process conditions for a time sufficient to effect conversion of acrylonitrile into 1,4-dicyano-1-butene, wherein said catalyst has the formula:



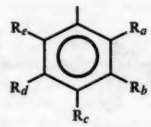
wherein:

P represents polystyrene crosslinked with at least about 1% of divinylbenzene;

—C_6H_4 represents a phenylene ring derived from and bound to said solid polymer of styrene;

—OR represents an alkoxy group wherein R is alkyl straight chain or branched, having 1–10 carbons, or cycloalkyl having 5–10 carbons;

—Ar represents an aryl group having the formula



wherein R_a through R_e are independently selected from the group consisting of:

(a) hydrogen;

(b) alkyl, straight chain or branched, having 1–10 carbons;

(c) cycloalkyl, having 5–10 carbons;

(d) —OR^3, wherein R^3 represents alkyl having 1–10 carbons or cycloalkyl having 5–10 carbons; and

(e) —$N(R^4R^5)$ wherein R^4 and R^5 are independently alkyl, straight chain or branched, having 1–10 carbons or cycloalkyl having 5–10 carbons;

wherein two of said R_a through R_e groups may form part of a fused alicyclic ring.

4,574,061

ALKOXY ARYL SULFONATE SURFACTANTS

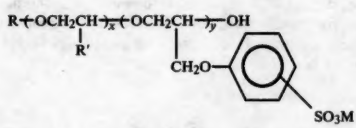
Donald G. Ries, Richmond, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 2, 1985, Ser. No. 729,775

Int. Cl.[4] C07C *143/42*

U.S. Cl. 260—512 C **3 Claims**

1. A sulfonate having the structural formula:



where in the above formula, R is a C_6–C_{20} alkyl or alkaryl group, R′ is from the group consisting of hydrogen or lower alkyl radicals of from 1–4 carbon atoms, x is an integer having the value between 0–50, y is an integer within the range of 1–5, and M is from the group consisting of sodium and potassium.

4,574,062

APPARATUS FOR TREATING CONTAMINATED GAS

Jacob Weitman, Tryffelvagen 8, S-611 63 Nykoping, Sweden

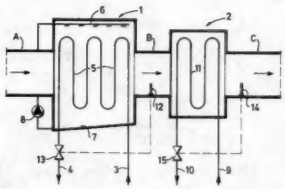
PCT No. PCT/SE81/00254, § 371 Date May 12, 1982, § 102(e) Date May 12, 1982, PCT Pub. No. WO82/00960, PCT Pub. Date Apr. 1, 1982

Continuation of Ser. No. 380,744, May 12, 1984, abandoned. This PCT application Sep. 11, 1981, Ser. No. 619,707

Claims priority, application Sweden, Sep. 12, 1980, 8006388

Int. Cl.[4] B01D *47/06, 47/12*

U.S. Cl. 261—147 **2 Claims**



1. An apparatus for treating air contaminated with impurities by scrubbing, humidifying and tempering the air to provide air having a predetermined degree of purity, a relative humidity of substantially 100% and a predetermined temperature, the apparatus comprising an inlet for contaminated air, an outlet for purified air and a flow path therebetween; injection means for injecting a spray of liquid into said flow path; and heat exchanger means in said flow path for providing contact surfaces having one side in contact with said spray and said air and another side in contact with a heat transporting fluid, wherein:

said flow path extends from said inlet to said outlet radially outwardly through said heat exchanger means for directing air along said flow path;

said heat exchanger means comprises first and second pluralities of axially stacked layers of coils of tubular elements, said pluralities being axially spaced from one another, each said layer including radially inner and outer coils interconnected for the passage of said heat transporting fluid through said tubular elements from a coil inlet means connected to said outer coils to a coil outlet means connected to said inner coils;

said injecting means comprises first and second pluralities of injection nozzles disposed radially inwardly of said first and second pluralities of coils, respectively, for directing said spray thereagainst; and

said inlet includes first and second inlet ducts positioned and arranged for directing contaminated air across said first and second pluralities of coils generally radially outwardly thereof.

4,574,063

METHOD OF FORMING GLASS OR CERAMIC ARTICLE

George W. Scherer, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 492,890, May 9, 1983, abandoned, which is a continuation of Ser. No. 339,395, Jan. 15, 1982, abandoned. This application Jun. 27, 1983, Ser. No. 508,185

Int. Cl.[4] C04B *35/14;* C03B *37/016*

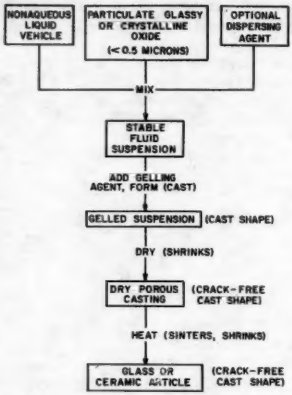
U.S. Cl. 264—60 **37 Claims**

1. A method for making a porous glass or ceramic product which comprises the steps of:

(a) suspending a particulate glassy or crystalline oxide in a non-aqueous liquid vehicle to provide a stable fluid suspension of oxide particles, said particles having an average diameter not exceeding about 0.5 microns;

(b) forming the suspension into a selected configuration corresponding to that of the product to be made and causing the suspension to gel in that configuration, gellation being caused by the addition to the suspension of a

gelling agent in an amount at least effective to produce a gelled intermediate, and


NONAQUEOUS LIQUID VEHICLE
PARTICULATE GLASSY OR CRYSTALLINE OXIDE (<0.5 MICRONS)
OPTIONAL DISPERSING AGENT
MIX
STABLE FLUID SUSPENSION
ADD GELLING AGENT, FORM (CAST)
GELLED SUSPENSION (CAST SHAPE)
DRY (SHRINKS)
DRY POROUS CASTING (CRACK-FREE CAST SHAPE)
HEAT (SINTERS, SHRINKS)
GLASS OR CERAMIC ARTICLE (CRACK-FREE CAST SHAPE)

(c) drying the gelled intermediate while maintaining the configuration thereof to provide an integral, essentially crack-free porous product having the configuration of the gelled intermediate.

4,574,064

METHOD FOR CONTINUOUS CASTING OF OBJECTS OUT OF A HIGH-VISCOSITY CASTING MIX

Ilmari Paakkinen, Toijala, Finland, assignor to Oy Partek AB, Toijala, Finland

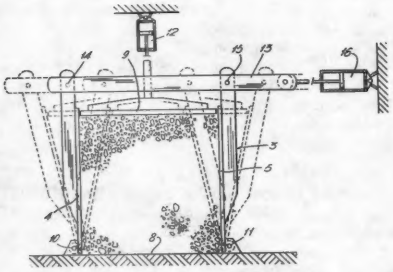
PCT No. PCT/FI82/00046, § 371 Date Jun. 10, 1983, § 102(e) Date Jun. 10, 1983, PCT Pub. No. WO83/01593, PCT Pub. Date May 11, 1983

PCT Filed Oct. 21, 1982, Ser. No. 506,548

Claims priority, application Finland, Nov. 10, 1981, 813556

Int. Cl.⁴ B28B *1/08*

U.S. Cl. 264—70 **4 Claims**



1. A method for continuous slide-casting of concrete objects or corresponding elements for compacting a high-viscosity mix in a slide-casting mold having a casting base and opposite wall portions comprising:

producing only parallel dislocations back and forth in various regional zones of the mechanically pressurized high-viscosity casting mix present in the mold, and in particular in parallel dislocation planes of the casting mix placed perpendicularly to the longitudinal direction of the casting base, pivoting at least two opposite wall portions of the slide-casting mold so as to be synchronized and always in the same direction in relation to each other, said pivoting provided around substantially parallel vertical shafts placed at a distance from each other, included in the planes of the mold walls, and being placed side by side in relation to the longitudinal direction of the casting base.

4,574,065

NON-DIRECTIONAL FLOOR TILE

Francis J. Appleyard, East Petersburg, and John H. Young, Lancaster, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 564,033, Dec. 21, 1983, abandoned. This application Jul. 27, 1984, Ser. No. 635,057

Int. Cl.⁴ B32B *27/04, 27/20*

U.S. Cl. 264—76 **1 Claim**

1. A method for making an improved composition tile having a filled thermoplastic mass of a primary coloration, said mass being a thermoplastic binder system and a filler, the steps comprising:

(a) mixing together the thermoplastic binder system and a filler in a conventional mixing means,

(b) at some point prior to removing the mass of plastic material from the mixer, blending thereinto a mass of hard particle means of marble with a Mohs hardness of 2.5 to 3.5 and having a coloration different from the coloration of the thermoplastic mass,

(c) dumping the plastic mass from the mixer onto a two-roll mill or calendering means which will pass the mass between the nips of the rolls and form the mass of material into a sheet form, and then forming the sheet into a plurality of square tile units wherein the hard particle means added to the plastic mass will appear as a dot pattern distributed across the surface of the tile product appearing as non-directional, unsmeared shapes in the surface area of the tile product, with the hard particles being of a contrasting coloration to the coloration of the plastic mass, and said filled plastic mass of subparagraph (a) being in an elongated smeared direction.

4,574,066

PROCESS FOR THE EXPEDITIOUS FORMATION OF A HIGH STRENGTH SHAPED ARTICLE OF POLY(6-OXY-2-NAPHTHOATE-4-OXYBENZOATE)

John D. Gibbon, Charlotte, N.C.; Terry E. Lawler, Helena, Ala.; Hyun-Nam Yoon, Summit, and Larry F. Charbonneau, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

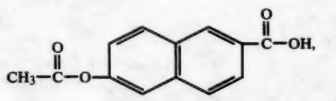
Filed Feb. 27, 1984, Ser. No. 583,643

Int. Cl.⁴ D01D *1/02, 5/08, 10/02*

U.S. Cl. 264—85 **28 Claims**

1. An improved process for the expeditious formation of a high strength shaped article of poly(6-oxy-2-naphthoate-4-oxybenzoate) which is capable of forming an anisotropic melt phase comprising:

(a) polymerizing under melt polymerization conditions in a polymerization zone at a temperature above 220° C. approximately 10 to 90 mole percent of monomer I and approximately 10 to 90 mole percent of monomer II with the evolution of acetic acid by-product, wherein monomer I is:



and monomer II is:

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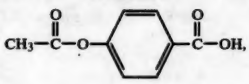


with the polymerization being conducted under a non-oxidizing gaseous atmosphere in the presence of a catalytic quantity of a potassium salt which is capable of catalyzing the polymerization, with said polymerization conditions including a polymerization temperature of at least 320° C. and which exceeds the melting temperature of the polymer product by at least 20° C. while operating at substantially atmospheric pressure until at least 95 percent of the stoichiometric quantity of acetic acid by-product is evolved and removed from said polymerization zone, and a subsequent polymerization temperature of at least 320° C. and which exceeds the melting temperature of the polymer by at least 20° C. while operating at a substantially reduced pressure of approximately 5 to 200 mm. of mercury to further increase the molecular weight of the polymer,

(b) melt extruding the resulting polymer product to form a shaped article, and

(c) increasing the strength of said shaped article by at least 50 percent by heating in a non-deleterious gaseous atmosphere at a temperature below the melting temperature of said shaped article for two hours or less.

4,574,067

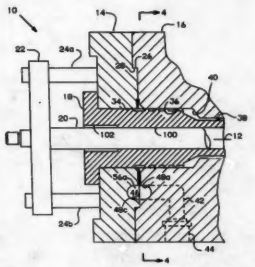
CROSSHEAD WITH STATIC MIXERS

Daryl D. Cerny, Greenville, Ohio, and Edwin J. Diebolt, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Mar. 1, 1985, Ser. No. 707,721

Int. Cl.[4] B29D *23/04*; B29F *3/04, 3/02*; B01F *7/24*

U.S. Cl. 264—209.8 **45 Claims**



1. A crosshead for extruding a thermoplastic material along a longitudinal axis, which crosshead comprises:

supply passage means, being disposed radially outward from said longitudinal axis, for receiving molten thermoplastic material;

distribution passage means, comprising a first distribution branch that is in fluid communication with said supply passage means, for providing an annular flow of said thermoplastic material;

mixing passage means, being in fluid communication with said annular flow of said distribution passage means, and having an exit with a first cross sectional area, for mixing said thermoplastic material as said thermoplastic material flows through said mixing passage means;

forging passage means, being disposed circumferentially around said longitudinal aixs, being in fluid communication with said exit of said mixing passage means, and having an outlet that is in fluid communication with said die opening, for compressively forging said thermoplastic material into a tubular layer of thermoplastic material having a second cross sectional area that is greater than said first cross sectional area; and

extrusion opening means, comprising a core that is disposed along said longitudinal axis, comprising a die opening that is annularly disposed around said core, and comprising the annular space between said core and said die opening, for extruding said compressively forged layer of thermoplastic material into a tubular layer of thermoplastic material having a third cross sectional area that is substantially equal to said annular space.

31. A method for extruding a thermoplastic material along a longitudinal axis, through an extrusion opening that lies intermediate of a core and an annularly disposed die opening, and into a tubular layer of thermoplastic material, which method comprises:

(a) injecting a flow of molten thermoplastic material into a crosshead;

(b) providing an annular stream of said thermoplastic material that is circumferentially disposed around said longitudinal axis and that is radially spaced apart therefrom by dividing said injected flow of thermoplastic material into two separate streams, flowing one of said streams of said thermoplastic material partially around said longitudinal axis in one direction, and substantially completing encirclement of said longitudinal axis by flowing the other of said streams of said thermoplastic material partially around said longitudinal axis in the other direction;

(c) feeding said annularly disposed stream of said thermoplastic material into an annularly disposed mixing passage that includes an entry, and that includes an exit having a first cross sectional area;

(d) mixing said thermoplastic material as said thermoplastic material flows through said mixing passage from said entry to said exit;

(e) compressively forging said thermoplastic material into a tubular layer of thermoplastic material having a second cross sectional area that is larger than said first cross sectional area; and

(f) extruding said tubular layer of thermoplastic material through an extrusion opening having a third cross sectional area.

4,574,068

UNIVERSAL LOGIC CARD

William D. Hill, San Jose; William A. Mercanti, Jr., Campbell; Christian K. Apple, Mountain View, all of Calif., and Gary S. Loomis, Johnston, R.I., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 449,221, Dec. 14, 1982, abandoned.

This application Mar. 27, 1985, Ser. No. 717,467

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—259 **2 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 68 Pages)

1. A universal logic card adapted to execute a selected transfer functions in a nuclear power plant comprising:

first programmable digital logic means including;

a plurality of input latches,

a plurality of output latches,

a first digital processor,

a first programmable memory means effective to direct said first digital processor to execute said selected transfer function, and

first means for controlled coupling of said first digital processor to said plurality of input latches and said plurality of output latches to operate said selected transfer function in real time analog an actual operating path for exercising responses to said transfer function;

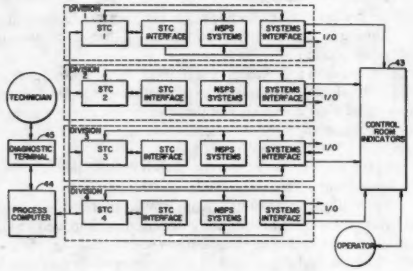
second means for controlled coupling including;

a second digital processor,

means selectively coupling said input latches to said second microprocessor,

means selectively coupling said output latches to said second microprocessor, and

second program memory means effective to direct said first digital processor to execute said transfer function and to compare the input latches and output latches for verifying processing of said selected transfer function;



third means for controlled coupling of said first digital processor to said plurality of input latches and said plurality of output latches to operate said transfer function in a short time transparent domain along said actual operating path to test, but not exercise, responses to said transfer function.

4,574,069

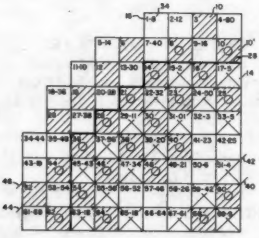
IN-CORE FUEL MANAGEMENT FOR NUCLEAR REACTOR

Malcolm F. Ross, Bloomfield, and Sidney Visner, W. Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 209,165, Nov. 21, 1980, Pat. No. 4,451,427, which is a continuation of Ser. No. 874,955, Feb. 3, 1978, abandoned. This application Feb. 6, 1984, Ser. No. 577,632

Int. Cl.[4] G21C *19/20*

U.S. Cl. 376—267 **5 Claims**



1. In the first cycle of a pressurized water nuclear power reactor having a multiplicity of elongated, square fuel assemblies supported side-by-side to form a generally cylindrical, stationary core consisting entirely of fresh fuel assemblies, wherein the assemblies are of three enrichment types, each assembly of the first type having a substantially similar low average fissile enrichment of at least about 1.8 weight percent U-235, each assembly of the second type havin$_c$ a substantially similar intermediate average fissile enrichment at least about 0.4 weight percent greater than that of the first type, and each assembly of the third type having a substantially similar high average fissile enrichment at least about 0.4 weight percent greater than that of the intermediate type, the arrangement of the low, intermediate, and high enrichment assembly types which comprises:

a. a generally cylindrical inner core region consisting of approximately two-thirds the total assemblies in the core and forming a figurative checkerboard array having

1. a first checkerboard component at least two-thirds of which consists of high enrichment and intermediate enrichment assemblies, at least some of the high enrichment assemblies containing fixed burnable poison shims, and
2. a second checkerboard component consisting of assemblies other than the high enrichment type; and

b. a generally annular outer region consisting of the remaining assemblies and including at least some but less than two-thirds of the high enrichment type assemblies.

4,574,070

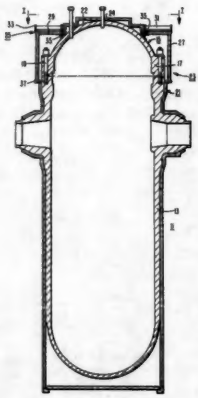
THERMAL INSULATION OF NUCLEAR REACTOR

Ronald M. Blaushild, Penn Hills, and Richard E. Tome, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,490

Int. Cl.[4] G21C *11/08*

U.S. Cl. 376—289 **14 Claims**



1. A nuclear reactor including a vessel having a body and a head, a thermal insulating shield for said head, said shield including a plurality of removable, one-piece shielding units of thermal insulating material, each said unit being of generally inverted L longitudinal cross section and including a generally vertical member and a generally horizontal member rigidly joined to said vertical member, means, on each shielding unit, cooperative with units adjacent to said each unit in said thermal insulating shield, for interlocking said each unit with its said adjacent units, said interlocking means being structured to permit separation of said each unit from interlock with its said adjacent units by displacement of said each unit relative to its said adjacent units, said units, when each unit is interlocked with its said adjacent units forming an effective thermal insulating shield for said head with said generally vertical members extending along said head laterally and said generally horizontal members extending over at least a portion of said head and means, on said each unit, remotely operable, to interlock said each unit with its said adjacent units or, when said each unit and its said adjacent units are interlocked, to displace said each unit relative to its said adjacent units to separate said each unit from interlock with its said adjacent units.

4,574,071

PROCESS FOR REMOVING DISSOLVED OXYGEN FROM WATER USING HYDRAZINE

Sunil G. DeSilva, Wilkins Township, Allegheny County, and Charles W. Hearp, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 537,924, Sep. 30, 1983, abandoned. This application Dec. 5, 1984, Ser. No. 678,380

Int. Cl.[4] C23F *11/08*

U.S. Cl. 422—14 8 Claims

1. In a process for the removal of dissolved oxygen from the aqueous media circulated in a steam generation system having copper alloy feedtrain components, including in series a feedwater heating system, steam generator, condenser, and condenser pump operative to recycle aqueous medium to the system through the feedwater heaters, and wherein hydrazine is added to the aqueous media, prior to said feedwater heaters, to react with said dissolved oxygen, the improvement wherein:

the hydrazine-containing aqueous media, after passage through the condenser pump, is contacted with in a column of an effective amount of a noble metal, selected from the group consisting of palladium and platinum, dispersed on a stable carrier material for a period of time effective to react the hydrazine with the dissolved oxygen at a temperature of between about 20°–40° C. and at a pressure of between about 50–150 psig, to reduce the dissolved oxygen content of the aqueous media to a value of less than 10 parts per billion, prior to passage of the aqueous medium to the feedwater heaters so as to reduce formation of oxides of copper which could be transported to and cause corrosion of the steam generator.

4,574,072

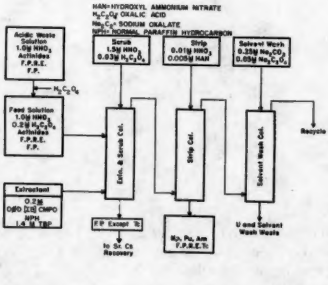
METHOD FOR EXTRACTING LANTHANIDES AND ACTINIDES FROM ACID SOLUTIONS BY MODIFICATION OF PUREX SOLVENT

E. Philip Horwitz, and Dale G. Kalina, both of Naperville, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 608,299, May 8, 1984, which is a division of Ser. No. 517,475, Jul. 26, 1983. This application May 21, 1984, Ser. No. 612,199

Int. Cl.[3] B01D *11/04;* C01F *17/00;* C22B *59/00;* C01G *56/00*

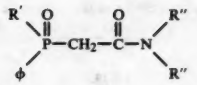
U.S. Cl. 423—9 20 Claims



1. A process for the recovery of multivalent lanthanide and actinide values from an aqueous acid solution containing these and other values comprising:

adjusting the molarity of the acid in the aqueous solution to between 0.1 and 12.0 M to form a feed solution;

contacting the feed solution with an extraction solution consisting of an organic extractant and a phase modifier in an inert water-immiscible organic diluent, the extractant having the formula:



where ϕ is phenyl, R′ is a straight or branched alkyl containing from 6 to 12 carbon atoms and R″ is an alkyl containing from 3 to 6 carbon atoms, the phase modifier is selected from the group consisting of tri-n-butyl phosphate, dibutyl butylphosphonate, tris(2-ethylhexyl)phosphine oxide, dihexylsulfoxide and methylisobutyl ketone, whereby the multivalent lanthanide and actinide values are selectively extracted from the feed solution, thereby loading the extraction solution,

separating the loaded extractant solution from the feed solution, and

stripping the multivalent lanthanide and actinide values from the extraction solution.

4,574,073

PROCESS FOR MANUFACTURING COARSE, CRYSTALLINE ALUMINA

Klaus Meyer, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 477,863, Mar. 23, 1983, abandoned. This application Jan. 23, 1985, Ser. No. 694,032

Claims priority, application Switzerland, Mar. 29, 1982, 1911/82

Int. Cl.[4] C01F *7/02*

U.S. Cl. 423—111 7 Claims

1. A process for manufacturing single crystal, coarse, crystalline alumina, α-Al_2O_3, of average crystal diameter larger than or equal to 10μ suitable for grinding, lapping and polishing which comprises providing a material consisting of charged dry absorption alumina from dry absorption scrubbing units for dry scrubbing the waste gases given off during the aluminum reduction process in connection with fused salt reduction cells producing aluminum, said material containing all of the impurities picked up during said process and calcining the starting material to provide single crystal, coarse, crystalline alumina having an average crystal diameter larger than or equal to 10 μ.

4,574,074

PROCESS FOR THE PRODUCTION OF ALUMINUM TRIHYDROXIDE HAVING A MEDIUM OF LESS THAN 4 MICRONS, WHICH CAN BE VARIED AS REQUIRED

Benoit Cristol, and Jacques Mordini, both of Provence, France, assignors to Aluminum Pechiney, Gardanne, France

PCT No. PCT/FR83/00210, § 371 Date Jun. 13, 1984, § 102(e) Date Jun. 13, 1984, PCT Pub. No. WO84/01569, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 18, 1983, Ser. No. 622,083

Claims priority, application France, Oct. 20, 1982, 82 17955

Int. Cl.[4] C01F *7/02*

U.S. Cl. 423—124 14 Claims

1. In a process for the production of aluminum trihydroxide by decomposing a supersaturated sodium aluminate solution by adding aluminum trihydroxide primer to said sodium aluminate solution and said solution is agitated to precipitate aluminum trihydroxide, the improvement comprising grinding the aluminum trihydroxide primer until said primer has a specific B.E.T. surface area of at least 8 square meters per gram, adding said primer to a hot supersaturated sodium aluminate solution at a temperature of from 30°–80° C. in a quantity up to 20 grams per liter of said solution such that the total surface area of said primer added is at least 100 square meters per liter of sodium aluminate solution, and then agitating the resulting suspension until a weight ratio of dissolved Al_2O_3 to caustic Na_2O of at most 0.7 is obtained, whereby aluminum trihydroxide having a

median diameter of less than 4 microns, with unimodal distribution and minimum deviation is precipitated.

4,574,075

PURIFICATION OF ALKALI METAL NITRATES

Jack D. Rickly, Dumont, N.J., and B. Timothy Pennington, Sulphur, La., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 6, 1984, Ser. No. 678,858
Int. Cl.[4] C01F *11/36*
U.S. Cl. 423—184 22 Claims

1. The process for removing heavy metal contaminants from an impure alkali metal nitrate containing them which comprises:

a. admixing said impure alkali metal nitrate with sufficient water to form an aqueous solution thereof;

b. adjusting the pH of said aqueous solution to within the range from between 2 and about 6;

c. adjusting the concentration of nitrite ion in said aqueous solution to provide at least six times the stoichiometric proportion necessary to reduce said heavy metal impurities contained therein;

d. admixing sufficient basic material with the aqueous alkali metal nitrate solution to raise the pH of the resulting mixture to above about 6, whereby a precipitate of solid heavy metal contaminants forms within said aqueous solution; and

e. separating said solid heavy metal contaminants from the resulting purified aqueous solution of alkali metal nitrate.

4,574,076

REMOVAL OF HYDROGEN SULFIDE FROM GEOTHERMAL STEAM

Harry M. Castrantas, Newtown, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 4, 1976, Ser. No. 738,651
Int. Cl.[4] C01B *17/16, 31/20;* B01D *53/44;* F03G *7/02*
U.S. Cl. 423—224 15 Claims

1. A process for removing hydrogen sulfide from geothermal steam which comprises passing geothermal steam containing hydrogen sulfide through a steam pipe at a temperature below 195° C., but not below the boiling point of water at atmospheric pressure, under conditions of turbulent flow and injecting into said steam pipe a base and hydrogen peroxide.

4,574,077

PROCESS FOR PRODUCING PITCH BASED GRAPHITE FIBERS

Seiichi Uemura, Tokyo; Takao Hirose, Kamakura; Yoshio Sohda, Kawasaki; Takayoshi Sakamoto, Hiratsuka, and Yoshio Kishimoto, Yokosuka, all of Japan, assignors to Nippon Oil Company Limited, Japan

Filed Oct. 10, 1984, Ser. No. 659,261
Claims priority, application Japan, Oct. 14, 1983, 58-190953; May 1, 1984, 59-37286; May 31, 1984, 59-10958
Int. Cl.[4] D01F *9/14*
U.S. Cl. 423—447.6 5 Claims

1. A process for producing a pitch-based graphite fiber, which process comprises treating a pitch fiber in an oxidative gas atmosphere to render it infusible, said pitch fiber being obtained by melt-spinning a carbonaceous pitch, then heat-treating the infusiblized fiber at 400°–750° C. in an inert gas atmosphere to obtain a precarbonized fiber containing 1 to 20 percent by weight of oxygen, then raising the temperature to 2,000°–3,000° C. at a rate of 500° C. or higher per minute in an inert gas atmosphere and heat-treating the precarbonized fiber at the raised temperature of 2,000°–3,000° C. in said inert gas atmosphere.

4,574,078

PROCESS AND APPARATUS FOR PREPARING MONODISPERSED, SPHERICAL, NON-AGGLOMERATED METAL OXIDE PARTICLES HAVING A SIZE BELOW ONE MICRON

Paolo Cortesi, Chivasso; Gianni Donati, Rho, and Giuseppe Saggese, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 22, 1984, Ser. No. 582,546
Claims priority, application Italy, Feb. 25, 1983, 19819 A/83
Int. Cl.[4] C01G *31/02*
U.S. Cl. 423—592 8 Claims

1. A process for preparing spherical, submicronic, monodispersed, and non-agglomerated particles of metal oxides by reacting with steam a gaseous stream containing an aerosol of liquid particles of a hydrolyzable metal compound of a metal selected from the class consisting of titanium, aluminum, zirconium, chromium, vanadium, gallium and iron, characterized in that into a duct, in which flows an inert gas stream containing vapors of said hydrolyzable metal compound, there is fed through a nozzle a cold inert gas stream, the temperatures and flow rates of the two gaseous streams being such as to establish in the duct a temperature lower than the condensation temperature of the said metal compound; the mixed gaseous streams having a turbulent flow in the duct with a Reynolds number equal to or higher than 1,800; and at the duct outlet, the aerosol of the said metal compound liquid particles, which has formed in the duct, is reacted with steam, wherefore solid particles of hydrated oxide of said metal form, which are then calcined to the corresponding metal oxide.

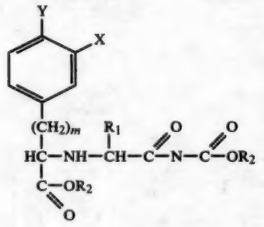
4,574,079

RADIOLABELED ANGIOTENSIN CONVERTING ENZYME INHIBITORS FOR RADIOLABELING MAMMALIAN ORGAN SITES

Haralambos P. Gavras, 11 Coolidge Rd., Wayland, Mass. 01778; James W. Ryan, 3420 Poinciana Ave., Miami, Fla. 33133, and Alfred Chung, 8781 SW. 87th Ave., Miami, Fla. 33125

Filed May 27, 1983, Ser. No. 498,736
Int. Cl.[4] A61K *43/00, 49/00, 49/02;* C07C *103/52*
U.S. Cl. 424—1.1 10 Claims

1. A radiolabeled angiotensin converting enzyme (ACE) inhibitor having the general formula:



wherein

X is a radiolabeling substituent,

Y is hydroxy, alkoxy containing from 1 to 6 carbon atoms, phenoxy, benzyloxy or amino,

R_1 is hydrogen or methyl,

R_2 is hydrogen, an ester moiety hydrolyzable under mammalian in vivo conditions or an ionically bonded anion of a physiologically acceptable non-toxic salt, and

m is an integer of from 1 to 6.

9. A method of radioimaging a mammalian site which comprises administering into a blood vessel in the mammal a dose of from about 0.01 mg to about 15 mg, per kilogram of body weight, of a radiolabeled angiotensin converting enzyme (ACE) inhibitor as described in claim 1, and then scanning the mammal to produce an image of the site.

4,574,080

COMBINATION FORMULATION

Stig Roswall, Soborg, and Lene B. Thorhus, Holte, both of Denmark, assignors to A/S Alfred Benzon, Copenhagen, Denmark

Filed Aug. 15, 1983, Ser. No. 523,635

Claims priority, application Denmark, Aug. 13, 1982, 3652/82

Int. Cl.[4] A61K *9/22, 9/48, 9/50, 9/54*

U.S. Cl. 424—20 **29 Claims**

1. A pharmaceutical oral controlled release multiple-unit dosage form containing a multiplicity of individual coated units, each unit containing an active substance coated with a water-insoluble, but water diffusible controlled release coating, each unit additionally comprising particles of active substance adhered to the surface of the controlled release coating in a substantially uniform layer, the particles being at least one power of ten smaller than the coated unit.

4,574,081

ANTIPLAQUE DENTIFRICE HAVING IMPROVED FLAVOR

Stephen J. Shymon, Metuchen, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Sep. 25, 1984, Ser. No. 654,351

Int. Cl.[4] A61K *7/18, 7/22*

U.S. Cl. 424—52 **19 Claims**

1. An antiplaque dentifrice having improved flavor comprising as the essential ingredients, an effective amount of at least about 0.01% by weight antiplaque quaternary ammonium compound, said dentifrice being devoid of a fluoride-providing compound or containing a fluoride-providing compound in amount which provides about 0.005–1% by weight of fluoride ion, about 0.8–1 2% by weight of a flavoring agent formulation consisting essentially of from at least 15% up to 45% by weight of anethol, from at least 31% up to 46% by weight of menthol and from at least 24% up to 39% by weight of peppermint, and about 0.2–0.6% by weight of a sweetening agent in the weight ratio of about 6:1 to 1.3:1 flavoring agent:sweetening agent, in a dental vehicle comprising about 35–65% by weight of a water-insoluble dental abrasive and humectant containing about 18–30% by weight of at least one of glycerin, sorbitol and polyethylene glycol and about 0.5–5% by weight of a nonionic gelling agent.

4,574,082

ONE-PHASE SILICONE-BASED COSMETIC PRODUCTS CONTAINING WAX

Marlene Tietjen; Jane Hollenberg, both of New York, and Richard T. Rigg, Brooklyn, all of N.Y., assignors to Revlon, Inc., New York, N.Y.

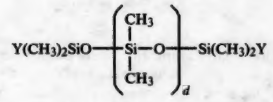
Filed Jul. 29, 1983, Ser. No. 518,497

Int. Cl.[4] A61K *7/021, 7/025*

U.S. Cl. 424—63 **19 Claims**

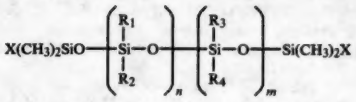
1. An anhydrous homogeneous single-phase cosmetic stick, cake or cream composition comprising:

(a) 2 to 50 wt. % of dimethylpolysiloxane having the formula



wherein the Y substituents are both —CH_3 or both —OH, and wherein the degree of polymerization d is sufficient to impart to the dimethylpolysiloxane a viscosity of 0.65 to 10^6 centistokes at 25° C.;

(b) 2 to 50 wt. % of an organosilane having the formula $RSi(CH_3)_3$ or an oragano-polysiloxane having the formula



or mixtures thereof, wherein R is alkyl having 1 to 30 carbon atoms, or an aryl substituent which is phenyl or a phenyl ring connected to the Si by an alkylene bridge up to 3 carbons long or by a vinyl group;

R_1 and R_3 are independently alkyl having 1 to 30 carbon atoms, or an aryl substituent which is phenyl or a phenyl ring connected to the Si by an alkylene bridge up to 3 carbons long or by a vinyl group;

R_2 is alkyl having 2 to 30 carbon atoms, an aryl substituent which is phenyl or a phenyl ring connected to the Si by an alkylene bridge up to 3 carbons long or by a vinyl group, or trimethylsiloxy;

R_4 is alkyl having 2 to 30 carbon atoms, or an aryl substituent which is phenyl or a phenyl ring connected to the Si by an alkylene bridge up to 3 carbons long or by a vinyl group;

n is 1 to 100; m is 0 to 100; and (n plus m) is 1 to 100;

X is alkyl or alkyloxy wherein the alkyl group contains 1 to 30 carbon atoms; and

(c) 4 to 30 wt. % of a cosmetically acceptable wax which does not form a homogeneous single-phase mixture with component (a); provided that there is a sufficient amount of component (b) present that the product formed by cooling to 25° C. a molten, stirred mixture of components (a), (b) and (c) is a single homogeneous phase.

4,574,083

ISOLATES OF PYTHIUM SPECIES WHICH ARE ANTAGONISTIC TO *PYTHIUM ULTIMUM*

Ralph Baker, Fort Collins, Colo., and Ran Lifshitz, Ramat Chen, Israel, assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Nov. 29, 1983, Ser. No. 555,941

Int. Cl.[4] A01N *63/00;* **C12N** *1/14, 15/00;* **C12R** *1/648*

U.S. Cl. 424—93 **5 Claims**

1. A biologically pure culture of Pythium isolate N2 having the identifying characteristics of ATCC 20692.

4,574,084

PROCESS FOR THE PREPARATION OF A MODIFIED AQUEOUS CHLORITE SOLUTION, THE SOLUTION PREPARED BY THIS PROCESS AND THE USE THEREOF

Peter Berger, Rathausstrasse 44,, 6900 Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP84/00046, § 371 Date Oct. 24, 1984, § 102(e) Date Oct. 24, 1984, PCT Pub. No. WO84/03274, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 2, 1984, Ser. No. 668,273

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306753; Mar. 3, 1983, 33075697

Int. Cl.[4] A61K *33/20, 33/40, 33/42*

U.S. Cl. 424—128 **20 Claims**

1. A process for the preparation of a stabilized, modified, aqueous chlorite solution comprising the steps of:

providing an aqueous acid solution having a pH of less than about 3;

adding a peroxy compound to said aqueous acid solution; and

introducing an aqueous chlorite solution into the acid solution to which said peroxy compound has been added, until the pH of said acid solution exceeds 7 and the solution becomes a greenish color.

4,574,085
METHOD FOR USING DIALYSIS SOLUTION CONTAINING GLYCEROL

Ralph E. Dolkart, Brugge, Belgium, and Nicholas J. Kartinos, Park Ridge, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 15, 1981, Ser. No. 263,818
Int. Cl.[4] A61K *31/70*; A61K *31/195, 33/06, 33/14, 33/22*
U.S. Cl. 424—148 **14 Claims**

1. A method of performing peritoneal dialysis by inserting into the peritoneal cavity a substantially sugar-free dialysis solution which comprises a water solution of pH 5.6 to 7.4, having physiological salts and glycerin present in concentrations sufficient to safely effect the removal of solutes and water from the patient by diffusion through the peritoneal membrane, said glycerin being present in a concentration of 0.5 to 40 grams per liter; allowing said dialysis solution to dwell in the peritoneal cavity for a period of time sufficient to permit said diffusion of solutes in water; and thereafter removing said dialysis solution from the peritoneal cavity.

4,574,086
METHOD FOR RETARDING DEGRADATION OF FOOD COLORS AND FLAVORS

John R. Shackelford, LaGrange, Ill., assignor to Hercules Incorporated, Wilmington, Del.

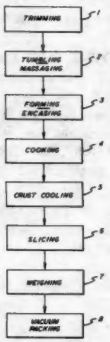
Continuation-in-part of Ser. No. 150,298, May 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 967,077, Dec. 6, 1978, abandoned. This application Apr. 28, 1981, Ser. No. 258,373
Int. Cl.[4] A23L *1/272*
U.S. Cl. 426—62 **7 Claims**

1. A method for retarding loss of natural color and retarding the appearance of unnatural color in dry food blends consisting essentially of: mixing a natural vegetative oleoresin color additive with an amount of dried yeast product effective to stabilize the color of the additive to form a stabilized additive and then mixing the stabilized additive into a dry food to form a dry food blend having a stabilized color.

4,574,087
PORTION PRE-SLICED ROAST BEEF PRODUCT AND PROCESS

Roger C. Sheehy, Providence, R.I., and Irwin Muskat, Manchester, N.H., assignors to Granite State Packing Company, Manchester, N.H.

Continuation of Ser. No. 473,067, Mar. 7, 1983, abandoned. This application Nov. 9, 1984, Ser. No. 670,362
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—129 **12 Claims**



1. A method of producing a packaged sliced whole muscle roast beef without appreciable loss of muscle fiber and structure, comprising the following steps:

Step 1: trimming a fresh boneless whole muscle primal piece of beef while leaving connective tissue;

Step 2: massaging directly, without intermediate processing steps, the piece so prepared along with others with added water and flavorings and allowing said piece to take up water and soften;

Step 3: placing said piece so massaged and softened but still as a whole muscle into a shape-determining encasement having a substantially uniform cross-section end-to-end;

Step 4: cooking rare-to-medium said piece while so encased;

Step 5: crust cooling said piece while still encased;

Step 6: removing said piece from said encasement, said piece having and holding substantially the shape of said encasement;

Step 7: while applying a confining force on the sides and ends, slicing said piece so shaped across the longitudinal axis thereof in a single pass through a multi-blade slicer producing slices of uniform thickness;

Step 8: weighing said piece so sliced while keeping the slices together in substantially airtight contact and establishing the conformity thereof to a predetermined weight desired for all the roasts of a series; and

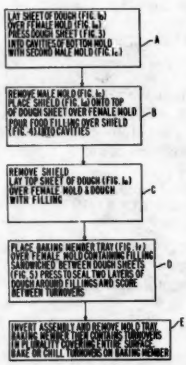
Step 9: vacuum packing said piece in an airtight container for shipment, said slicing and all steps subsequent thereto being done in a manner to virtually exclude air from contacting the faces of said slices and thus virtually eliminating premature blooming of said slices prior to unpackaging,

whereby said piece so packaged is a sliced whole muscle rare-to-medium roast beef substantially all of the slices of which are of uniform weight and size.

4,574,088
METHOD FOR PRODUCING MULTIPLE FOOD TURNOVERS

Arthur H. Bowden, 429 43rd Ave., San Francisco, Calif. 94121

Filed Feb. 17, 1984, Ser. No. 581,315
Int. Cl.[4] A21D *13/08*
U.S. Cl. 426—275 **2 Claims**


LAY SHEET OF DOUGH (FIG. 1a) OVER FEMALE MOLD (FIG. 1b) PRESS DOUGH SHEET (FIG. 3) INTO CAVITIES OF BOTTOM MOLD WITH SECOND MALE MOLD (FIG. 1c)
A
REMOVE MALE MOLD (FIG. 1c) PLACE SHIELD (FIG. 1d) ONTO TOP OF DOUGH SHEET OVER FEMALE MOLD POUR FOOD FILLING OVER SHIELD (FIG. 4) INTO CAVITIES
B
REMOVE SHIELD LAY TOP SHEET OF DOUGH (FIG. 1e) OVER FEMALE MOLD & DOUGH WITH FILLING
C
PLACE BAKING MEMBER TRAY (FIG. 1e) OVER FEMALE MOLD CONTAINING FILLING SANDWICHED BETWEEN DOUGH SHEETS (FIG. 5) PRESS TO SEAL TWO LAYERS OF DOUGH AROUND FILLINGS AND SCORE BETWEEN TURNOVERS
D
INVERT ASSEMBLY AND REMOVE MOLD TRAY, BAKING MEMBER THEY CONTAINS TURNOVERS IN A QUALITY CONFORMING TO THE SURFACE BARE OR CHILL TURNOVERS ON BAKING MEMBER
E

1. A method of fabricating turnovers comprising:

providing a female die having a top surface and at least three concave food-receiving cavities extending down from said top surface, said cavities having an open top for receiving fillings and closed bottom and side portions for holding such fillings, the portions of said top surface between said open tops of said cavities constituting mullions which separate and surround said open tops,

lining said cavities of said female die with a first layer of dough,

providing a shield comprising a member having a two-dimensional array of through openings which correspond in their shapes and positions to said cavities of said female die, said through openings in said shield being separated by web portions which correspond in shape and size to said mullions on said die,

placing said shield over said die so that the openings of said shield are in registration with the open tops of said cavities and so that the webs of said shield cover said mullions of said die,

pouring food filling over said shield and said die until said cavities are filled to a predetermined degree and inaccurately enough so that portions of said filling fall onto the webs of said shield,

removing said shield with said portions of said filling thereon,

whereby upon removal of said shield, the mullions of said die will be left clear of filling so that fabrication speed of said turnovers will be enhanced,

covering said female die after said cavities are lined with said layer of dough with a second layer of dough so that the filling in each of said cavities is surrounded with dough,

placing a flat tray upon said second layer of dough, thereby forming an assembly,

inverting said assembly and pressing said flat tray and said female mold together so as to seal said second layer of dough to said first layer of dough at the areas of said mullions, and

removing said female die so as to leave formed turnovers on said flat tray.

4,574,089

PROCESS FOR PREPARING A LIQUID COFFEE AROMA

Joseph A. Musto, Bronx; Robert A. Scarella, Hawthorne, both of N.Y.; Harold W. Jacquett, Palisades, N.J.; Angelo V. Riolo, Parsippany, N.J., and Nicholas I. Della Fave, Ridgefield Park, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,756
Int. Cl.[4] A23F *5/48*
U.S. Cl. 426—386 **14 Claims**

1. A process for preparing a liquid coffee aroma comprising the steps of:

(a) condensing coffee grinder gas as a frost;

(b) placing the grinder gas frost in a pressure vessel;

(c) supplying heat to the contents of the vessel and allowing the frost to equilibrate at a pressure in excess of 750 psig, thereby forming three phases, a water phase, a liquid carbon dioxide phase, and a gaseous carbon dioxide phase;

(d) draining the water phase from the vessel;

(e) chilling a second vessel to a temperature of less than −80° F.;

(f) venting from below the liquid carbon dioxide surface in the first vessel through a line into the second vessel for a period sufficient to achieve pressure equilibration between the two vessels;

(g) isolating the second pressure vessel from the first;

(h) venting the second vessel so as to reach a pressure of 0 psig in the vessel;

(i) warming the contents of the second vessel with the vessel sealed to a temperature of between about 0° F. and 30° F., so as to sublime all residual carbon dioxide contained therein to the gaseous phase; and

(j) withdrawing a highly concentrated liquid coffee aroma from the second vessel which is essentially carbon dioxide free.

4,574,090

PROCESS OF MAKING A DOUGH CRUST

Jeno F. Paulucci, 2020 Washington Dr., Sanford, Fla. 32771

Filed Feb. 27, 1984, Ser. No. 583,615
Int. Cl.[4] A21D *8/00*
U.S. Cl. 426—439 **7 Claims**

1. A process of preparing a crust comprising the sequential steps of:

(a) producing a dough sheet having upper and lower surfaces;

(b) docking the dough sheet to provide a plurality of spaced-apart docking holes that extend through the dough sheet and to connect the upper and lower dough surfaces, said holes being large enough such that they do not close during cooking;

(c) cutting the sheet into individual dough pieces;

(d) baking each dough piece at a temperature and for a time sufficient to partially cook the dough thereby, forming a set, uniform bready interior and harder surfaces, the upper and lower dough surfaces and the surfaces through the docking holes being exposed to direct heat during baking and becoming hard forming a bond between the upper and lower surfaces of the dough, and sealing the dough surfaces against substantial oil penetration; and

(e) frying the partially cooked dough piece after the baking step for a time sufficient to cause said dough piece to have a fried outside appearance, a bready interior texture, and a crisp outer surface.

4,574,091

ASPARTAME-SWEETENED GELATIN DESSERT AND SWEETENING COMPOSITION THEREFOR

Wayne L. Steensen, Ridgefield, and Ronald C. Weaver, Danbury, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 28, 1984, Ser. No. 625,505
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—548 **24 Claims**

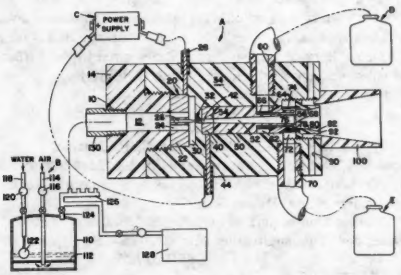
1. A composition consisting of (a) dipeptide sweetener; (b) a sugar alcohol in a weight ratio of from about 1:1 to about 2:1 based on the weight of the dipeptide sweetener; and (c) maltodextrin in a weight ratio of from about 1:1 to about 2:1 based on the weight of the dipeptide sweetener.

4,574,092

ELECTROGASDYNAMIC COATING SYSTEM

Meredith C. Gourdine, East Orange, N.J., assignor to Energy Innovations, Inc., East Orange, N.J.

Division of Ser. No. 447,478, Dec. 6, 1982, Pat. No. 4,498,631, which is a division of Ser. No. 310,534, Oct. 13, 1981, Pat. No. 4,433,003. This application Nov. 30, 1984, Ser. No. 677,064
Int. Cl.[4] B05D *1/04*
U.S. Cl. 427—33 **4 Claims**



1. A method of coating workpieces moving through a coating chamber from an upstream side toward a downstream side,

the coating chamber having an upstream electrogasdynamic gun for spraying charged particles contiguous to the upstream side, the method comprising:

(a) pressurizing a gas saturated with a condensable vapor;

(b) accelerating the saturated gas to a supersonic speed;

(c) ionizing and condensing the vapor into charged droplets;

(d) spraying a cloud of the charged droplets into the coating chamber to establish an electrostatic charge in the chamber;

(e) aspirating particles of a pigmented coating material into the ionized condensing vapor such that the vapor condenses on and charges the coating material particles and spraying the charged coating material particles into the coating chamber to establish a cloud of charged coating material contiguous with the upstream side of the coating chamber;

(f) alternately repeating steps (d) and (e) with the upstream gun such that clouds of charged droplets alone and droplet coated charged coating material particles are alternately established in the coating chamber whereby each repetition of step (d) shifts the preceding charged coating material cloud toward the downstream side of the coating chamber.

4,574,093

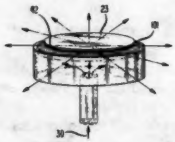
DEPOSITION TECHNIQUE

Herbert M. Cox, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 566,918

Int. Cl.[4] B05D *5/12*; C23C *16/00*

U.S. Cl. 427—86 **11 Claims**



1. A process for forming a material layer on a surface of a substrate comprising the steps of forming a precursor gaseous flow and directing said flow with a directing means to contact said substrate, thereby inducing formation of said material layer characterized in that (1) said surface of said substrate is, during said formation, spaced an average distance less than ¼ the substrate effective radius from a directing surface defined from said directing means by translating an incompressible imaginary sphere having a diameter of 1/10 the substrate effective radius along all accessible surfaces of said directing means and (2) at least 50 percent of said gas flow that contacts said substrate undergoes said contact initially at an interior point of said surface of said surface before it cuts a plane that is tangent to the periphery of said substrate and normal to the surface of said substrate upon which deposition is desired.

4,574,094

METALLIZATION OF CERAMICS

Michael A. DeLuca, Holbrook, and John F. McCormack, Roslyn Heights, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 502,748, Jun. 9, 1983, abandoned. This application May 21, 1984, Ser. No. 611,193

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **31 Claims**

23. A process for making a printed circuit on a ceramic substrate comprising:

(a) treating the ceramic surface with a melt comprising one or more alkali metal compounds to adhesion promote or etch the surface;

(b) exposing the surface to a adsorption promoter selected from the group consisting of ethoxylated non-ionic compounds and nitrogen-containing compounds, the nitrogen-containing compounds being selected from the group consisting of quaternary compounds, amine oxides, alkanolamines, amides, betaines, amino acids and guanadine derivatives, in an amount sufficient to, and at a pH which will promote adsorption of catalyst on the surface and eliminate bare spots in an adherent metal layer formed on the surface or selected parts thereof;

(c) treating the ceramic surface exposed to the adsorption promoter with a catalyst for electroless metal deposition;

(d) depositing metal onto the catalyzed surface;

(e) removing portions of the deposited metal to produce a metal printed circuit conductor pattern adhering to the surface of the ceramic substrate.

4,574,095

SELECTIVE DEPOSITION OF COPPER

Thomas H. Baum, San Jose; Frances A. Houle, Fremont; Carol R. Jones, San Jose, all of Calif., and Caroline A. Kovac, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,975

Int. Cl.[4] B05D *3/06, 5/12*

U.S. Cl. 427—53.1 **7 Claims**

1. A process for the selective deposition of copper on a substrate, said process comprising the steps:

(1) contacting the substrate with the vapor of a palladium compound;

(2) selectively irradiating said palladium compound with light to cause selective deposition of seeds of palladium metal on said substrate; and

(3) depositing copper by electroless deposition on those areas of the substrate which have been seeded with palladium.

4,574,096

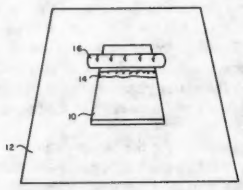
SUSPENSION METHOD OF IMPREGNATING ACTIVE MATERIAL INTO COMPOSITE NICKEL PLAQUE

William Ferrando, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1985, Ser. No. 740,115

Int. Cl.[4] B05D *5/12*; H01M *4/04*

U.S. Cl. 427—126.6 **15 Claims**



1. A process for impregnating a sintered nickel coated graphite fiber plaque with a nickel active material to form a nickel electrode comprising:

(1) forming a suspension of particles of a nickel active material selected from the group consisting of nickel hydroxide, nickel oxide, and mixtures thereof in ethylene glycol wherein the particles are 20 microns or less in size and wherein the weight ratio of ethylene glycol to nickel active material is from 1:1 to 1:4,

(2) gently working the suspension of nickel active material in

ethylene glycol into the sintered nickel coated graphte fiber plaque by

(a) applying the suspension onto the top surface of the plaque,

(b) gently pushing the suspension into the plaque while allowing the pull of gravity on the suspension to do much of the work; and

(c) removing any excess of suspension from the surface of the plaque;

(3) evaporating the ethylene glycol from the plaque to leave the particles of nickel active material distributed throughout the plaque; and

(4) repeating steps (2) through (3) until the desired amount of nickel active material has been deposited in the plaque.

10. A process for impregnating a sintered nickel coated graphite fiber plaque with a cadmium active material to form a cadmium electrode comprising:

(1) forming a suspension of particles of a cadmium active material selected from the group consisting of cadmium hydroxide, cadmium oxide, and mixtures thereof in ethylene glycol wherein the particles are 20 microns or less in size and wherein the weight ratio of ethylene glycol to cadmium active material is from 1:1 to 1:4;

(2) gently working the suspension of cadmium active material in ethylene glycol into the sintered nickel coated graphite fiber plaque by

(a) applying the suspension onto the top surface of the plaque,

(b) gently pushing the suspension into the plaque while allowing the pull of gravity on the suspension to do much of the work; and

(c) removing any excess of suspension from the surface of the plaque;

(3) evaporating the ethylene glycol from the plaque to leave the particles of the cadmium active material distributed throughout the plaque; and

(4) repeating steps (2) through (3) until the desired amount of nickel activated material has been deposited in the plaque.

4,574,097

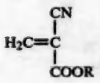
REINFORCED THIXOTROPIC GEL COMPOSITION

Travis W. Honeycutt, Irvine, Calif., assignor to Isopedix Corporation, Irvine, Calif.

Filed Aug. 10, 1984, Ser. No. 639,339
Int. Cl.[4] C08K *3/36*
U.S. Cl. 428—36 **26 Claims**

1. A thixotropic gel composition comprising

A. an α-cyanoacrylate monomer of the formula



wherein R is a member selected from the group consisting of an alkyl from approximately 1 to 16carbon atoms; phenyl, cyclohexyl, alkoxy-alkyl, allyl and furfuryl groups;

B. dry colloidal fumed silica;

C. a plasticizer;

D. a stabilizer;

E. a free radical scavenger; and

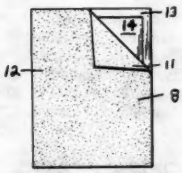
F. a filler in the form of fibers or spheres or mixtures of fibers and spheres substantially insoluble in and inert to said α-cyanoacrylate monomer.

4,574,098

PATTERN TRANSPOSING TAPE

James D. Sampson, 14257 Burning Tree Dr., Victorville, Calif. 92392

Continuation-in-part of Ser. No. 134,198, Mar. 27, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,913
Int. Cl.[4] B32B *7/10*; C09J *7/02*
U.S. Cl. 428—40 **7 Claims**



1. A thin flexible material having a pressure sensitive adhesive coating on each face, the adhesive coating on one face having greater adhesive capability than the adhesive coating on the opposite face whereby said material can be affixed to a surface of an object with the adhesive coating of lesser adhesive capability in contact therewith and whereby another surface, separate from said object, can then be brought into contact with said flexible material so that its adhesive coating of greater adhesive capability is in contact with the latter surface, and whereby said latter surface can then be pulled away from the surface of said object to leave said flexible material adherent to said latter surface in the form of a pattern defining an outline of at least part of said object;

said adhesive coating of greater adhesive capability comprising an elastomer selected from the group consisting of high molecular weight synthetic and natural rubbers, polyvinylethylether, and acrylate polymers and contains a quantity of tackifier resin sufficient to give it relatively high adhesive strength, and the adhesive coating of lesser adhesive capability comprising an elastomer selected from the group consisting of high molecular weight synthetic and natural rubbers, polyvinylethylether, and acrylate polymers and containing a quantity of tackifier resin less, on a percentage of total weight basis, than that in the adhesive coating of greater adhesive capability.

2. A thin flexible material in accordance with claim **1** in tape form.

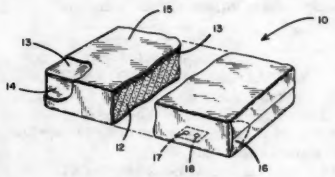
3. A thin flexible material in accordance with claim **2** having a removable liner on at least one of its faces.

4,574,099

ACOUSTICAL PANELS

Michael T. Nixon, 2810 N. Urbandale La., Plymouth, Minn. 55447

Filed Jan. 20, 1984, Ser. No. 572,466
Int. Cl.[4] B32B *1/04*
U.S. Cl. 428—68 **20 Claims**



1. An acoustical panel comprised of an inner core fabricated of a loosely woven fibrous material; at least one middle layer on at least one side of the inner core which enhances durability

without significantly reducing the sound absorption characteristics of the inner core; edge support means; an outer layer which surrounds and encapsulates said inner core, middle layer and edge supports, said outer layer being made of a plastic film material which is impermeable to moisture and air, and which, upon exposure to heat, shrinks to achieve smooth, tight surfaces; and means for venting gases from the interior of the panel during the heat shrinking of the outer layer.

4,574,100

PLASTICS MATERIAL MESH STRUCTURE

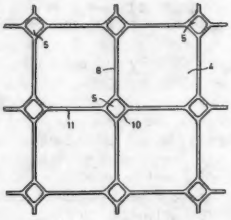
Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England

Continuation of Ser. No. 363,447, Mar. 30, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,724

Claims priority, application United Kingdom, Apr. 3, 1981, 8110472

Int. Cl.[4] B29C *17/02*; B32B *3/24*

U.S. Cl. 428—134 **19 Claims**



1. An integral plastics material mesh structure which has been formed by stretching a starting material having a thickness of at least 0.75 mm, the structure having a pattern of generally octagonal first openings and second openings which are substantially smaller than the first openings, each opening being bounded essentially by a plurality of orientated strands which are interconnected at respective junctions at each of which only three strands meet, and the crotches between the strands at the junctions being orientated in the direction running around the crotch.

4,574,101

EXERCISE MAT

Raymond A. Tricca, West Barnstable, and John K. Foster, Harwichport, both of Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.

Filed Sep. 2, 1983, Ser. No. 529,129

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—138 **14 Claims**

1. An exercise mat comprising a central, relatively thick core layer of closed-cell foam , said core layer having a plurality of air chambers therein, and two relatively thin outer skin layers of closed-cell foam , the density of said core layer being less than the density of each of said outer skin layers, each of said thin outer skin layers being laminated in sealed relationship to a respective outer surface of said thick core layer.

4,574,102

RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa; Terumi Matsuda, both of Kaisei; Akio Ishizuka, Fujinomiya, and Yoshihiko Shibahara, Minamiashigara, all of Japan, assignors to Fuji Photo Film Company, Ltd., Kanagawa, Japan

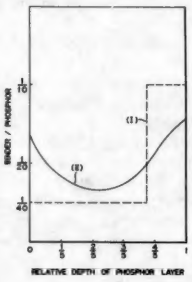
Filed Jun. 4, 1984, Ser. No. 617,021

Claims priority, application Japan, Jun. 3, 1983, 58-99237

Int. Cl.[4] B32B *7/00, 19/02, 19/04*

U.S. Cl. 428—212 **6 Claims**

1. A radiation image storage panel comprising a support, a phosphor layer provided on the support which comprises a binder and a stimulable phosphor dispersed therein, and a protective film provided on the phosphor layer, characterized in that a mixing ratio of the binder to the stimulable phosphor



in said phosphor layer so varies as to show a minimum value within a region of depth of from 1/5 to 4/5 of the thickness of the phosphor layer, the depth being expressed in terms of relative distance from the protective film-side surface.

4,574,103

VINYL CHLORIDE POLYMER LAMINATE

Richard W. Stamper, Lambertville, Mich., and Robert C. Hultz, Toledo, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 518,247, Jul. 28, 1983, Pat. No. 4,515,744. This application Mar. 6, 1985, Ser. No. 709,009

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—213 **3 Claims**

1. A laminate comprising

(A.) a first layer having a thickness of from about 12 to 50 mils, being of a compounded and stabilized vinyl chloride polymer plastisol composition containing antimony trioxide and being free of a curing agent and

(B.) a second layer on said first layer having a thickness of from about 12 to 50 mils, being of a compounded and stabilized vinyl chloride polymer plastisol composition containing titanium dioxide and being free of a curing agent, said layers having been heated at a temperature of from about 250° to 400° F. for from about one to five minutes to fuse said layers and to adhere said layers together to obtain a flexible vinyl chloride polymer laminate.

4,574,104

MULTI-LAYER FILM

Takanori Aishima; Makoto Utsumi, and Yoshihiro Ezaki, all of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,774

Claims priority, application Japan, Nov. 14, 1983, 58-213550

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—220 **22 Claims**

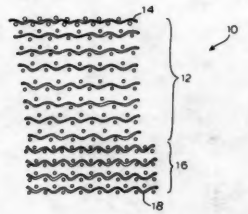
1. A multi-layer film comprising at least three layers, said three layers comprising two outer layers and an intermediate layer positioned between said outer layers,

said intermediate layer being a resin composition comprising from 90 to 10% by weight of a high density polyethylene and from 10 to 90% by weight of an ethylene α-olefin copolymer, each of said two outer layers comprises an ethylene α-olefin copolymer and at least one of said two outer layers is a resin composition comprising from 98 to 50% by weight of an ethylene α-olefin copolymer and from 2 to 50% by weight of a low density polyethylene produced by the high pressure polymerization method.

4,574,105
PENETRATION RESISTANT TEXTILE PANELS WITH PLIES OF NYLON AND PLIES OF KEVLAR

James G. Donovan, Norwell, Mass., assignor to Albany International Corp., Albany, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,438
Int. Cl.[4] B32B 5/02
U.S. Cl. 428—233 5 Claims

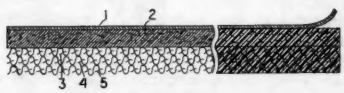


1. A penetration resistant textile panel, which comprises;
a plurality of plies of woven poly(p-phenylene terephthalamide) yarns forming the face of said panel; and
a plurality of plies selected from the group consisting of needled, non-woven staple fibers of a nylon polyamide and woven yarns of a nylon polyamide, forming the back side of the panel;
said face plies comprising one-half to three-quarters by weight of said panel and said back side plies comprising one-quarter to one-half by weight of said panel.

4,574,106
SELF MOLDING FIBERGLAS

Jimmy H. Rogers, P.O. Box 362, Point Clear, Ala. 36564

Filed Jul. 30, 1984, Ser. No. 636,104
Int. Cl.[4] B32B 5/26, 17/02, 17/06, 17/12
U.S. Cl. 428—236 3 Claims



1. A semi ridged composite sheet consisting of a sheet of aluminum bonded to a sheet of mat fiberglas which is bonded to several layers of fiberglas cloth.

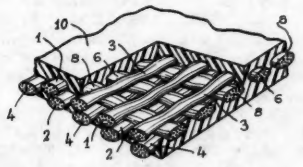
3. A semi ridged composite sheet consisting of a sheet of paper board bonded to a semi ridged sheet of mat fiberglas which is bonded to several layers of fiberglas cloth.

4,574,107
METHOD OF PRODUCING A COATED FABRIC

Serge Ferrari, La Tour du Pin, France, assignor to Tissage et Enduction Serge Ferrari S.A., La Tour du Pin, France

Filed Sep. 7, 1984, Ser. No. 648,249
Claims priority, application France, Sep. 20, 1983, 83 15117
Int. Cl.[4] B05D 3/02; B32B 7/00; D04H 1/58, 1/04
U.S. Cl. 428—259 14 Claims

11. A coated material produced according to the process comprising:
producing a plurality of weft threads comprised of a disintegrable material;
producing a plurality of weft threads comprised of a non-disintegrable material;
producing a plurality of warp threads comprised of a non-disintegrable material;
weaving a support fabric from said warp and weft threads wherein said disintegrable weft threads are interspersed among said non-disintegrable weft threads such that, if said disintegrable weft threads were removed:
(a) said warp threads would be disposed substantially in parallel in two substantially parallel layers, but with the threads in one layer laterally shifted relative to the threads in the other layer; and
(b) said non-disintegrable weft threads would be disposed substantially in parallel in a middle layer pressed between the two layers of warp threads, with the weft threads substantially orthogonal to the warp threads;



coating said support fabric with a coating composition comprised of substantially the same material as said disintegrable weft threads;
heating the coated support fabric at a temperature which will melt said disintegrable weft threads, fuse the coating composition and melted threads together, and gel the fused coating composition and melted threads.

4,574,108
FIBER REINFORCED COMPOSITE

Stoyko C. Fakirov, Sofia, Bulgaria, and Jerold M. Schultz, Newark, Del., assignors to University of Delaware, Newark, Del.

Continuation of Ser. No. 553,107, Nov. 18, 1983, abandoned.
This application May 2, 1985, Ser. No. 729,893
Int. Cl.[4] B32B 9/00; D02G 3/00
U.S. Cl. 428—292 4 Claims

1. In a reinforced plastic matrix of improved mechanical strength, having embedded therein reinforcing fibers, an improved reinforcing fiber characterized by:
a diameter variation along its axis producing alternate lengths of large diameter and small diameter wherein the axial distance from the smallest to the largest diameter of the fiber is 2 to 5 times the diameter variation to produce a socket in the matrix corresponding to the large diameter and small diameter lengths of the fiber, the small diameter socket locking the large diameter length of the fiber in the large diameter socket; and
the alternating large and small diameter lengths of the fiber forming a smoothly undulating contour free of sudden changes in diameter to minimize areas of stress concentration in the fiber under axial tension.

4,574,109
COMPOSITIONS INCORPORATING GLASS BEADS AND METHODS OF PREPARING THEM

Pierre Laroche, Nalinnes, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Nov. 8, 1984, Ser. No. 669,525
Claims priority, application United Kingdom, Nov. 24, 1983, 8331375
Int. Cl.[4] B32B 27/14, 5/16
U.S. Cl. 428—325 23 Claims

1. A composition comprising an intimate mixture of glass beads and finely divided material, wherein the glass beads have a mean diameter of not more than 80 micrometers and a size range spread which is at least half the mean diameter of the beads, and wherein said finely divided material is hydrophobic, inorganic, substantially chemically inert with respect to the beads, has a specific surface of at least 50 m^2/g, and is present

in said mixture in an effective amount not exceeding 5% by weight of the beads, whereby the bulk settled density of the mixture is greater than that of the glass beads alone and greater quantities of said composition can be incorporated in a specific amount of polymer resin for any selected viscosity than the quantity of glass beads alone which results in that viscosity.

4,574,110

PROCESS FOR PRODUCING MICROCAPSULES AND MICROCAPSULE SLURRY

Makoto Asano, Yokohama; Kiyoharu Hasegawa, Kamakura; Yukio Tamura, Shibata, and Yoshihiro Oono, Shiroishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,960

Claims priority, application Japan, Jul. 28, 1983, 58-136871; Apr. 11, 1984, 59-70959; Jun. 27, 1984, 59-130867

Int. Cl.[4] B01J *13/02*; B32B *27/42*

U.S. Cl. 428—402.21 **7 Claims**

1. Process for producing microcapsules by covering a hydrophobic material with an aminoaldehyde polycondensation product as a wall-forming material in an acidic aqueous medium containing an anionic water-soluble polymer, characterized in that a multi-component copolymer containing as essential monomer components thereof at least three types of acrylic monomers, which are selected respectively from (A) acrylic acid and/or methacrylic acid, (B) acrylonitrile and/or methacrylonitrile and (C) an acrylamidoalkylsulfonic acid and/or a sulfoalkyl acrylate, is used as the anionic water-soluble polymer, the proportions of said three types of monomers being from 20 to 70 mole percent of monomer (A), from 20 to 70 mole percent of monomer (B) and from 0.5 to 30 mole percent of monomer (C), respectively, and the amount of the anionic water-soluble polymer used being 0.5 to 10 weight percent of the microcapsule-producing system.

7. Microcapsule slurry obtained by covering a hydrophobic material with an aminoaldehyde polycondensation Product as a wall-forming material in an acidic aqueous medium containing an anionic water-soluble polymer, characterized in that the anionic water-soluble polymer is a multi-component copolymer containing as essential monomer components thereof at least three types of acrylic monomers selected respectively from (A) acrylic acid and/or methacrylic acid, (B) acrylonitrile and/or methacrylonitrile and (C) an acrylamidoalkylsulfonic acid and/or sulfoalkyl acrylate, the proportions of said three types of monomers being from 20 to 70 mole percent of monomer (A), from 20 to 70 mole percent of monomer (B) and from 0.5 to 30 mole percent of monomer (C), respectively, and the amount of the anionic water-soluble polymer used in the microcapsule-producing system being 0.5 to 10 weight percent.

4,574,111

ELECTRIC INSULATION

Hans-Joachim Henkel, and Norbert Müller, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 616,694, Jun. 4, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,061

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321268

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—461 **4 Claims**

1. An insulated electrical conductor comprising an electrically conducting material in combination with an electrically insulating polyolefin composition containing at least one alcoholate of magnesium, calcium or aluminum as an additive thereto, said additive acting upon said polyolefin composition to prevent the formation of water trees when said composition is dielectrically stressed by the presence of an electric field.

4,574,112

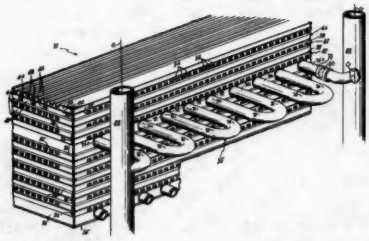
COOLING SYSTEM FOR ELECTROCHEMICAL FUEL CELL

Richard D. Breault, Coventry; Richard D. Sawyer, Canton, and Thomas E. DeMarche, New Haven, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1983, Ser. No. 564,989

Int. Cl.[4] H01M *8/24*

U.S. Cl. 429—26 **11 Claims**



1. In an electrochemical cell stack of the type which engages a first reactant inlet manifold, a first reactant outlet manifold, a second reactant inlet manifold and a second reactant outlet manifold and further has a first face which adapts the stack to engage the first reactant inlet manifold, a second face which adapts the stack to engage the first reactant outlet manifold, a third face which adapts the stack to engage the second reactant enlet manifold and a fourth face which adapts the stack to engage the second reactant outlet manifold, the electrochemical cell stack further including a plurality of heat producing cells and a cooling system for the cells, the cooling system including a plurality of cooler assemblies spaced from the other, each of which is disposed between a pair of heat producing cells and is adapted by channels extending therethrough to receive cooling tubes, the cooling system further including a means for circulating cooling fluid which includes a feed tube and a return tube, the improvement which comprises:

a plurality of conduits, each conduit extending in an associated cooler assembly between the feed tube and the return tube to form a flow path for cooling fluid which extends from the center of the feed tube to the center of the return tube and which has a minimum hydraulic diameter D_f, the conduit having a set of cooling tubes disposed in the channels of the cooler assembly, each tube having an inlet, an outlet, and an average hydraulic diameter D_t between the inlet and the outlet, each set of tubes including an entrance cooling tube, at least one intermediate cooling tube, and an exit cooling tube;

wherein the minimum hydraulic diameter D_f of each flow path extending from the center of the feed tube to the center of the return tube is equal to or greater than three fourths of the average hydraulic diameter of said cooling tubes D_t to avoid plugging of the flow path at the minimum hydraulic diameter of the flow path under long term operative conditions,

wherein the inlet of the entrance tube is joined to and is in flow communication with the feed tube, the outlet of the exit tube is joined to and is in flow communication with the return tube and the inlet of each intermediate tube is joined to and is in flow communication with the outlet of an adjacent tube such that the cooling tubes extending between the feed tube and the return tube are serially connected in serial flow communication to provide a tortuous flow path for cooling fluid through an associated cooler assembly which has a flow resistance characteristic that ensures a predetermined supply of cooling fluid to each cooler assembly, and

wherein at least one entrance cooling tube is adjacent to the second face and extends across the stack between the third face and the fourth face.

4,574,113

RECHARGEABLE CELL

Richard T. Gray, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 199,141, Oct. 22, 1980. This application Jul. 15, 1981, Ser. No. 283,325
Int. Cl.[4] H01M *4/60, 4/40, 10/40*
U.S. Cl. 429—194 13 Claims

1. A substantially anhydrous cell comprising a cathode which comprises a mixture of polyacetylene powder and an electrically conductive material, an organic solvent, an electrolyte comprising a salt which is soluble in said solvent and an inorganic intercalating anode, said cathode being insoluble in said solvent when said cathode is either undoped or p-doped, said solvent being stable to electrochemical decomposition and the anions of said salt being capable of p-doping said polyacetylene when an external electrical power source is supplied to said cell.

4,574,114

PHOTOSENSITIVE COMPOSITION FOR ELECTROPHOTOGRAPHY HAVING POLYVINYL CARBAZOLE AND SILICONE OIL

Masahiro Tsutsumi; Toru Nakazawa, both of Osaka, and Yasuharu Utsunomiya, Nara, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Nov. 16, 1983, Ser. No. 552,108
Claims priority, application Japan, Dec. 25, 1982, 57-228828
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—81 12 Claims

1. A photosensitive composition for electrophotography, comprising:

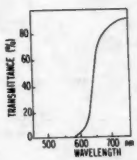
a single photoconductive layer of a uniform dispersion of polyvinyl carbazole, a charge-generating organic pigment, and as a sensitizing agent a silicone oil.

4,574,115

SILVER HALIDE LIGHT-SENSITIVE MATERIALS HAVING A LAYER OF GRAINS HAVING DYE ABSORBED THEREON

Keiichi Adachi; Tadashi Ikeda, and Tadaaki Tani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1984, Ser. No. 643,202
Claims priority, application Japan, Aug. 22, 1983, 58-152961
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—522 20 Claims



1. A silver halide light-sensitive material comprising a support having coated thereon

(1) an emulsion layer containing light-sensitive silver halide grains, and

(2) a layer containing grains selected from the group consisting of silver halide, zinc oxide, lead oxide, titanium oxide, cadmium oxide, copper oxide, tin oxide, thallium halides, cadmium sulfide and CdSe grains on which a dye which is capable of being adsorbed on said grains so as to give sharp absorption is adsorbed and which cannot be substantially developed and are sparingly soluble in water, wherein the absorption maximum of said adsorbed dye is separated by 20 nm or more from the sensitization maximum of an emulsion layer located in a position farther from the incident light of exposure than the layer containing said dye.

4,574,116

METHODS AND CELL LINES FOR IMMORTALIZATION AND MONOCLONAL ANTIBODY PRODUCTION BY ANTIGEN-STIMULATED B-LYMPHOCYTES

Henry S. Kaplan, Stanford; Nelson N. H. Teng; Kit S. Lam, both of Palo Alto, all of Calif., and Francisco Calvo-Riera, Leon, Spain, assignors to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Filed Jan. 13, 1983, Ser. No. 457,795
Int. Cl.[4] C12P *21/00;* C12N *15/00, 13/00, 5/00*
U.S. Cl. 435—68 15 Claims

1. A method for producing a heteromyeloma comprising:

fusing in a fusing medium (a) first human myeloma donor cells, which cells are sensitive to a first selective means and have a gene providing resistance to a second selective means originating from said gene being introduced into said donor cells in vitro with (b) rodent recipient myeloma cells capable of stable maintenance in vitro without significant secretion of their own immunoglobulin proteins and significantly less sensitive than said donor cells to said first selective means but sensitive to the second selective means to which said gene provides resistance, to provide a mixture of cells including recipient cells having at least one donor chromosome containing said resistance gene;

growing said mixture of cells under selective conditions for sensitivity to said first and second selective means; and

isolating heteromyelomas comprising recipient cells having at least one chromosome of said donor cells bearing said gene.

4,574,117

STABILIZATION OF PHENYLALANINE AMMONIA-LYASE IN A BIOREACTOR USING REDUCING AGENTS

Patricia J. Vollmer, and Jeffrey J. Schruben, both of Paducah, Ky., assignors to Genex Corporation, Rockville, Md.

Filed Jun. 6, 1984, Ser. No. 617,805
Int. Cl.[4] C12P *13/22;* C12N *9/96, 9/88*
U.S. Cl. 435—108 6 Claims

1. A method for producing L-phenylalanine which comprises:

(a) cultivating a PAL-producing microorganism under aerobic, growth-promoting conditions;

(b) inducing the cells produced in step (a) to make PAL under PAL-producing conditions;

(c) forming a bioreaction mixture by combining, under L-phenylalanine-producing conditions, the PAL produced by step (b) with t-cinnamic acid and ammonium ions in the presence of one or more reducing agents, to produce L-phenylalanine; and

(d) recovering the L-phenylalanine so produced.

4,574,118

PREDICTING HYDROCARBON POTENTIAL OF AN EARTH FORMATION UNDERLYING A BODY OF WATER BY ANALYSIS OF SEEPS CONTAINING LOW CONCENTRATIONS OF CARBONACEOUS GASES

Gerard J. Demaison, Orinda, and Isaac R. Kaplan, Sherman Oaks, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 366,542, Apr. 8, 1982, Pat. No. 4,444,889, which is a continuation of Ser. No. 135,026, Mar. 28, 1980, abandoned. This application Dec. 29, 1983, Ser. No. 566,929
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.[4] G01N *33/24*
U.S. Cl. 436—29 3 Claims

1. Method of on-site collection and examination of small

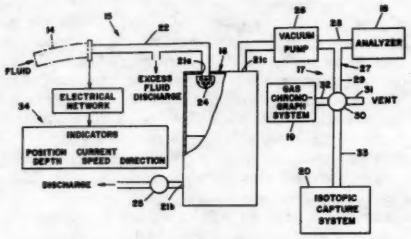
concentrations of methane dissolved in water so as to predict hydrocarbon potential of an earth formation underlying a body of water, said formation being a source of said methane, said method comprising:

(a) at a known geographic location, continuously sampling said water at a selected flow rate and at a selected depth;

(b) continuously vacuum separating said water into liquid and gas phases;

(c) quantitatively separating interfering gas species from said methane at a series of separating stations by conveying said separated gas phase of step (b) via an air carrier vented to atmosphere and flowing at a known flow rate, in seriation to and through said separating stations; said separation at said separating stations including the substeps of:

(i) removing water vapor and molecular carbon dioxide



from the passing gas phase in the presence of said air carrier;

(ii) oxidizing any carbon monoxide to carbon dioxide;

(iii) trapping the carbon dioxide of step (ii); and

(iv) cryogenically trapping out all low-, mid-, and high-range molecular weight hydrocarbons above C_1;

(d) quantitatively oxidizing said methane in the gas phase at an oxidizing station without significant isotopic fractionation occurring;

(e) cryogenically trapping the gaseous oxidant of step (d) in the form of carbon dioxide at a trapping station without significant isotopic fractionation occurring; and

(f) isotopically analyzing said trapped oxidant of step (e) for carbon distribution so as to determine biogenic and/or thermogenic origin of said methane and thereby aid in the evaluation of the hydrocarbon potential of said earth formation.

4,574,119

CHROME-MAGNESITE REFRACTORIES AND METHOD OF PREPARATION

John D. Perry, Calumet, Canada, and David J. Michael, White Oak, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 11, 1984, Ser. No. 619,671

Int. Cl.⁴ C04B *35/12*

U.S. Cl. 501—114 **4 Claims**

1. A refractory brick made from a size graded batch comprising 20–30 weight percent magnesite containing less than 0.8 weight percent silica, and the remainder a chrome ore whose ratio between the oxides of chromium and the oxides of aluminum and iron is greater than 2 to 1, having a silica content less than 2.7 weight percent, an iron oxide content less than 17 weight percent, and wherein the chrome ore to magnesite ratio is between 2.33 and 4 to 1.

4,574,120

METHOD FOR PREPARING HIGH ACTIVITY SILICA SUPPORTED HYDROTREATING CATALYSTS

Mark S. Thompson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 15, 1984, Ser. No. 660,624

Int. Cl.⁴ B01J *27/04, 27/10, 23/74*

U.S. Cl. 502—220 **4 Claims**

1. A method for preparing a silica supported hydrotreating catalyst containing from about 10–25%w molybdenum and from about 1–5%w nickel and/or cobalt as hydrogenation metals which comprises:

(a) reacting a mixture of $MoCl_5$ and a compound selected from the group consisting of $Ni(H_2O)_6Cl_2$, $Co(H_2O)_6Cl_2$ and mixtures thereof in amounts to provide a desired catalytic metals concentration of the support in the presence of a solubilizing amount of acetonitrile;

(b) heating the mixture to between about 25° and 80° C. until most of the metal compounds have reacted and/or dissolved;

(c) removing any undissolved solids from the solution;

(d) impregnating the dried silica support with the hydrogenation metals-containing solution in one or more steps; and

(e) drying the impregnated silica support at elevated temperature.

4,574,121

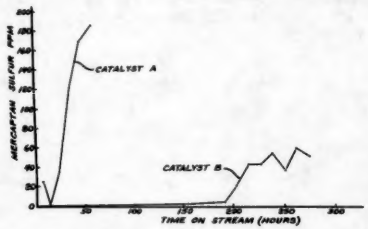
METAL CHELATE MERCAPTAN OXIDATION CATALYST

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 555,910, Nov. 29, 1983, Pat. No. 4,498,977. This application Nov. 26, 1984, Ser. No. 675,099

Int. Cl.⁴ B01J *31/22;* **C10G** *27/10, 29/00*

U.S. Cl. 502—163 **11 Claims**



1. A catalytic composite comprising a metal chelate mercaptan oxidation catalyst in an amount from about 0.01 to about 20 weight percent based on said catalytic composite and a solid carrier material having an average particle size of less than about 110 mesh.

7. The catalytic composite of claim **1** wherein said composite contains a quaternary ammonium salt.

10. A catalytic composite comprising a metal chelate mercaptan oxidation catalyst selected from the group consisting of metal phthalocyanine and metal compounds of tetrapyridinoporphyrazine in an amount from about 0.01 to about 20 weight percent based on said catalytic composite and a solid carrier material having an average particle size of less than about 110 mesh.

4,574,122
SUBSTITUTED O-ACYLGLYCOSYLAMIDES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Bernd-Wieland Krüger, Wuppertal; Oswald Lockhoff, Cologne; Peter Stadler, Haan; Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany; Hans-Georg Opitz, Emeryville, Calif.; Klaus G. Stünkel, Wuppertal, and Hans-Joachim Zeiler, Velbert, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

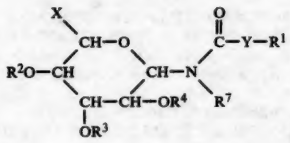
Filed Nov. 28, 1984, Ser. No. 675,690

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344257

Int. Cl.[4] A61K *31/70*; C07H *5/06*

U.S. Cl. 514—42 **13 Claims**

1. A compound of the formula



in which

X is hydrogen or the radical $-CH_2OR^5$,

three of R^2, R^3, R^4 and R^5 each independently is hydrogen or

and the fourth is

Y and Z each independently is oxygen, sulphur, NH or CH_2, and

R^1, R^6 and R^7 each independently is an optionally substituted hydrocarbon radical having up to 50 carbon atoms.

12. A method of activating the immune system of a patient which comprises administering to a patient an amount effective therefor of a compound according to claim **1**.

4,574,123
4,4'-ALKYLENEDIPIPERIDINE DERIVATIVES

Philip N. Edwards, Bramhall, and Michael S. Large, Congleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

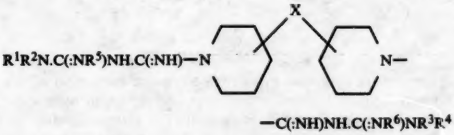
Filed May 3, 1984, Ser. No. 606,688

Claims priority, application United Kingdom, May 9, 1983, 8312665

Int. Cl.[4] C07D *401/14*; A01N *43/40*; A61K *31/445*

U.S. Cl. 514—210 **8 Claims**

1. A 4,4'-alkylenebis[piperidine-1-(N-amidinoamidine)] derivative of the formula:



or a tautomeric form thereof, wherein each of R^1, R^2, R^3 and R^4, which may be the same or different, is hydrogen or an alkyl, alkenyl or alkoxyalkyl radical each having up to 20 carbon atoms; or R^1, R^2 and the nitrogen atom to which they are attached, or R^3 and R^4 and the nitrogen atom to which they are attached, which may be the same or different, are each a 1-azetidinyl, 1-pyrrolidinyl, piperidino, hexamethyleneimino, heptamethyleneimino, morpholino or 4-(1–8C alkanoyl)-1-piperazinyl radical each of which may bear 1–3C alkyl substituents; a 3–20C cycloalkyl radical; or a phenyl or phenylalkyl radical optionally substituted by chlorine, bromine, iodine or fluorine atoms, or by amino, carbamoyl, cyano, hydroxy, nitro, trifluoromethyl, methyl, ethyl, propyl, butyl, pentyl, hexyl, methoxy, ethoxy, propoxy, acetamido, propionamido, butyramido, methylamino, ethylamino, propylamino, acetyl, propionyl, butyryl, methoxycarbonyl, ethoxycarbonyl, dimethylamino or diethylamino radicals; provided that at least one of R^1, R^2, R^3 and R^4 is other than hydrogen; X is a direct bond or a 1–6C straight- or branched-chain alkylene radical which is linked to the 3- or 4-positions of the piperidine rings; and R^5 and R^6, which may be the same or different, are each hydrogen or a 1–8C alkyl radical; and the acid addition salts thereof.

6. An antibacterial or antifungal composition comprising an effective antibacterial or antifungal amount of a compound as claimed in claim **1** and an inert diluent or carrier therefor.

4,574,124
LIPID ABSORPTION-INHIBITING AGENTS AND THEIR USE

Hans-Joachim Kabbe, Leverkusen; Hans-Peter Krause, and Rüdiger Sitt, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

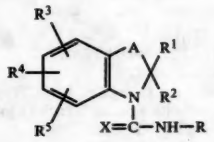
Division of Ser. No. 424,828, Sep. 27, 1982, Pat. No. 4,460,607, which is a division of Ser. No. 206,314, Oct. 31, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 573,168

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945238; Aug. 8, 1980, 3030024

Int. Cl.[4] A61K *31/535*; C07D *265/28*

U.S. Cl. 514—228 **11 Claims**

1. An alkylurea derivative of the formula (I)



in which

R represents a straight-chain, branched or cyclic alkyl or alkenyl radical, with in each case 6 to 18 carbon atoms, the said alkyl and alkenyl groups optionally being substituted by chlorine, bromine, fluorine, alkoxy with 1 to 4 carbon atoms, or by phenyl,

R^1 and R^2 are identical or different and each represent an alkyl radical with 1 or 2 carbon atoms,

R^3, R^4 and R^5 are identical or different and each represent a hydrogen, chlorine, or bromine atom or a trifluoromethyl, alkyl, alkylmercapto, or alkoxy radical, the said alkyl and alkoxy radicals or moieties each containing 1 to 4 carbon atoms, or represent a phenoxy or chlorophenoxy radical,

A represents

in which

R' and R'' are identical or different and each denote a hydrogen atom or a methyl or ethyl radical, and

X represents oxygen.

9. A method of combating diseases of the lipometabolism in warm-blooded animals which comprises administering to the animals a hypolipidemically effective amount of a compound as defined in claim 1 either alone, or in admixture with an inert pharmaceutical carrier in the form of a medicament.

4,574,125

NAPHTHO-[1,2-B]-QUINOLIZIUM DERIVATIVES AS ANTIDIARRHEAL AGENTS

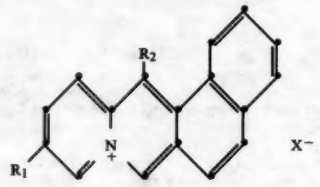
Michael H. Fisher, Ringoes, and Thomas M. Jacks, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 23, 1984, Ser. No. 603,027

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—284 7 Claims

1. A method for the treatment of enterotoxin-caused diarrhea which comprises administering to a human or animal afflicted with such diarrhea an effective amount of a compound having the formula:



I

wherein:

R_1 and R_2 are independently hydrogen, loweralkyl, loweralkoxy or halogen; and

X is halogen.

4,574,126

PYRIDINE DERIVATIVES HISTAMINE H_2-ANTAGONISTS

David G. Cooper, Letchworth, and George S. Sach, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

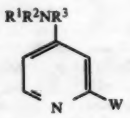
Filed Mar. 9, 1983, Ser. No. 473,520

Claims priority, application United Kingdom, Mar. 17, 1982, 8207835; Mar. 31, 1982, 8209540

Int. Cl.[4] A61K *31/445;* C07D *213/57, 213/36*

U.S. Cl. 514—318 15 Claims

1. A compound of the formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where

R^1 and R^2 are the same or different and are C_{1-6} alkyl or with the nitrogen atom to which they are attached form a pyrrolidino or piperidino group;

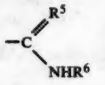
R^3 is C_{1-4}alkylene;

W is a group $-XYCH_2CH_2NHR^4$ in which

Y is methylene or sulphur;

X is methylene or oxygen, provided that it is methylene when Y is sulphur, and

R^4 is a group of formula (2):



(2)

where R^5 is NCN, NNO_2, NH or $CHNO_2$ and R_6 is hydrogen, hydroxy, amino, C_{1-6} alkyl or when Y is methylene, C_{2-4} alkynyl except that R^5 is not NH when R^6 is hydrogen.

15. A method for blocking histamine H_2-receptors which comprises administering to an animal an effective amount to block said receptors of a compound of claim 1.

4,574,127

OXAZOLES AND THIAZOLES CONTAINING AN AMINOHYDROXYPROPOXYPHENYL MOIETY

John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 7, 1984, Ser. No. 607,906

Int. Cl.[4] C07D *277/28, 263/32;* A61K *31/42, 31/425*

U.S. Cl. 514—365 3 Claims

1. A compound which is a member of the group

2-{p-[3-(3,4-dimethoxyphenylethylamino)-2-hydroxypropoxy]phenyl}oxazole;

(S)-{p-[3-(3,4-dimethoxyphenylethyl)amino-2-hydroxypropoxy]phenyl}thiazole; and

2-[p-(3-cyclopropylamino-2-hydroxypropoxy)phenyl]-thiazole;

and, the pharmacologically acceptable acid addition salts thereof.

4,574,128

5-(4-CHLORO-3-SULFAMOYLBENZOYL)-2,3-DIHYDRO-2-BENZOFURANCARBOXYLIC ACIDS AND THEIR COMPOSITIONS HAVING DIURETIC, SALURETIC AND URICOSURIC ACTIVITY

Bernhard Seuring; Hans-Jochen Lang, both of Hofheim am Taunus; Max Hropot, Flörsheim am Main, and Roman Muschaweck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

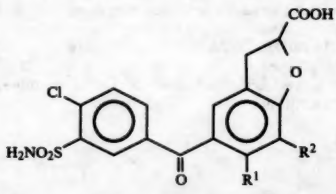
Filed May 15, 1984, Ser. No. 610,484

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317884

Int. Cl.[4] A61K *31/34;* C07D *307/85*

U.S. Cl. 514—469 3 Claims

1. A 5-(4-Chloro-3-sulfamoylbenzoyl)-2,3-dihydro-2-benzofurancarboxylic acid of the formula I



I

in the form of a racemic mixture or an optical isomer, in which R1 and R2 are identical or different and represent hydrogen, halogen or methyl, and its physiologically tolerated salts.

3. A pharmaceutical composition having diuretic, saluretic and uricosuric activity comprising an effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,574,129
TOPICAL NONSTEROIDAL ANTI-INFLAMMATORY METHODS

Xina Nair, East Amherst, N.Y., and Davis L. Temple, Jr., Wallingford, Conn., assignors to Bristol-Myers Company, New York, N.Y.

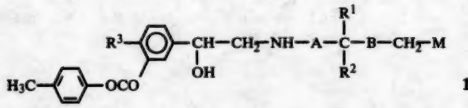
Division of Ser. No. 575,418, Jan. 31, 1984, Pat. No. 4,540,581. This application May 23, 1985, Ser. No. 737,119

Int. Cl.[4] A61K *31/24, 31/405*

U.S. Cl. 514—540 7 Claims

1. A method of reducing topical inflammation in a mammal in need thereof which comprises topically administering to said mammal an amount effective to produce a topical anti-inflammatory effect of a composition comprising

(a) a compound of the formula



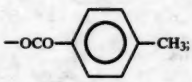
wherein R^1 and R^2 are independently hydrogen or (lower)-alkyl, provided that R^1 and R^2 cannot both be hydrogen;

wherein M is phenyl, indole or hydrogen;

wherein A is $(-CH_2-)_n$ in which n is 0, 1 or 2;

wherein B is $(-CH_2-)_m$ in which m is 0, 1 or 2; and

wherein R^3 is —OH or



and

(b) a compatible, topically acceptable vehicle.

4,574,130
POLYMERIZABLE COMPOUNDS

William D. Potter, Bishops Stortford, and Sinan B. Kiamil, Harlow, both of United Kingdom, assignors to Smith & Nephew Associated Companies P.L.C., United Kingdom

PCT No. PCT/GB83/00165, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO84/00163, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 30, 1983, Ser. No. 557,142

Claims priority, application United Kingdom, Jul. 3, 1982, 8219303

Int. Cl.[4] C08F *222/20*

U.S. Cl. 523—111 7 Claims

1. An adhesive emulsion polymer of monomers consisting essentially of one or more acrylic monomers selected from the group consisting of acrylic and methacrylic acids or alkyl esters or hydroxyalkyl esters or amides thereof and one or more monomers of the formula (I):

$$CH_2{=}C(R){-}COO{-}(CH_2{-}CH(CH_3){-}O{-})_x{-}(CH_2{-}CH_2{-}O)_y{-}OC{-}A{-}COOH$$

or a salt thereof, wherein

R is H or CH_3,

x is an integer from 2 to 20,

y is an integer from 0 to 5, and A is an alkylene, alkenyl or phenylene radical such that $A(COOH)_2$ is a dibasic acid capable of forming an anhydride $A(CO_2)O$.

2. A polymer according to claim 1 which is a pressure-sensitive adhesive polymer of monomers which comprise 39 to 59% by weight of n-butyl acrylate, 39 to 59% by weight of 2-ethylhexyl acrylate, 0.3 to 5% by weight of acrylamide or hydroxyethyl methacrylate and 1 to 5% by weight of a methacrylyl poly(oxypropylene) succinate mono ester containing an average of 7 oxypropylene units per molecule or the ammonium salt thereof.

4. An adhesive surgical or medical dressing comprising a pressure-sensitive adhesive polymer according to claim 2.

4,574,131
PREPARATION OF HIGH-IMPACT NYLON MOLDING MATERIALS

Rainer Theysohn, Frankenthal; Hans G. Dorst, Deidesheim; Graham E. McKee, Weinheim; Rolf Steinberger, Schifferstadt; Walter Ziegler, Edingen-Neckarhausen, and Franz Zahradnik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,813

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331730

Int. Cl.[4] C08K *3/34*

U.S. Cl. 523—209 1 Claim

1. A process for the preparation of high-impact nylon molding materials, containing 30–88% by weight of a thermoplastic nylon, 10–50% by weight of an organosilane-coated silicate reinforcing filler, 0.1–5% by weight of a polyurethane ionomer, 2–30% by weight of a carboxyl-containing thermoplastic elastomer and, as an option, effective amounts of conventional additives, wherein, in a first stage, the silicate filler coated with an organosilane and a polyurethane ionomer is mixed with the nylon at above the melting point of the latter, and in a second stage the thermoplastic elastomer is finely dispersed in the filler-containing nylon at above the melting point of the latter.

4,574,132
GENERAL PURPOSE EXPANDABLE ADHESIVE

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 9, 1984, Ser. No. 669,919

Int. Cl.[4] C08K *3/36*

U.S. Cl. 523—466 2 Claims

1. A general purpose expandable adhesive having bonding properties of improved tensile strength and with reduced void formations, improved chemical resistance, improved heat distortion, and improved thixotropic properties, said general purpose expandable adhesive comprising, in parts by weight a first portion comprised of about 74 parts of diglycidyl ether of bisphenol A, about 7.4 parts of diglycidyl ether of 1,4-butanediol, about 3.8 parts of submicroscopic silica thickener thixotrope, about 14.8 parts of silica of about 325 mesh particle size, about 37.0 parts of an amidoamine curing agent, and of a second portion comprised of from about 6 to about 12 parts of the copolymerized product of the monomer of 6-caprolactone and the diglycidyl ethers of bisphenol A and 1,4-butanediol; said first portion undergoing shrinkage during curing while said second portion is undergoing expansion during curing as a result of the expansion that said monomer of 6-caprolactone undergoes and as a result forces its way into crevices that would not be penetrated with said first portion that undergoes shrinkage, thereby producing a near strain-free adhesive bond as a result of the reaction of said first portion with said second portion whereby shrinkage of said first portion is offset by expansion of said second portion to prevent stress buildup in the adhesive matrix comprised of said first portion and said second portion of said general purpose expandable adhesive.

4,574,133

POLYMER COMPOSITION

Jeffrey D. Umpleby, Ferney-Voltaire, France, assignor to BP Chemicals Limited, London, England

Filed Dec. 17, 1984, Ser. No. 682,193

Claims priority, application United Kingdom, Jan. 5, 1984, 8400149

Int. Cl.[4] C08K 5/51

U.S. Cl. 524—147 16 Claims

1. A crosslinkable composition comprising a silyl modified ethylene (co) polymer and a phosphorus or antimony compound containing at least one X-R group wherein X represents the phosphorus or antimony, R is a hydrogen atom or is an organic substituent which is bonded to atom X via a carbon or oxygen atom and wherein X is in the trivalent or pentavalent state and further comprising a silanol condensation catalyst.

4,574,134

ANTIHAZE COMPOSITIONS AND PROCESS

Kenneth W. Willcox, and Kenneth R. Mills, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 9, 1984, Ser. No. 669,907

Int. Cl.[4] C08K 5/17, 5/20, 5/42; C08L 9/06

U.S. Cl. 524—157 27 Claims

1. A molding composition consisting essentially of:

(1) a copolymer of conjugated diene/monovinyl-substituted aromatic hydrocarbon monomer; wherein said conjugated diene has from 4 up to about 12 carbon atoms per molecule and said monovinyl-substituted aromatic hydrocarbon monomer has from 8 up to about 18 carbon atoms per molecule;

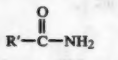
(2) 0.1 to about 10 parts by weight per 100 parts copolymer of at least one compound having the formula

$$M(NO_2)_m$$

where m=1 when M is the ammonium ion or an alkali metal, and m=2 when M is an alkaline earth metal; and

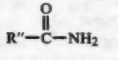
(3) an amount of at least one antihaze agent sufficient to reduce haze in said composition when subjected to injection molding conditions, wherein said at least one antihaze agent is selected from the group consisting of:

(a) saturated fatty acid amides of the formula



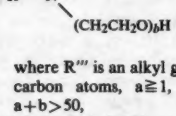
where R′ is a saturated hydrocarbon radical having about 11 to about 23 carbon atoms,

(b) unsaturated fatty acid amides of the formula



where R″ is a mono-unsaturated hydrocarbon radical having about 11 to about 23 carbon atoms,

(c) tertiary alkanolamines of the formula



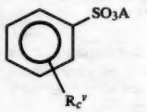
where R‴ is an alkyl group having about 7 to about 20 carbon atoms, a≧1, b≧1, with the proviso that a+b>50,

(d) hydrocarbyl sulfates of the formula

$R^{iv}SO_3A$

where R^{iv} is an alkyl, aryl, cycloalkyl, alkaryl or aralkyl radical having about 9 to about 21 carbon atoms and A is a cation selected from the group consisting of alkali metal cations and the ammonium ion,

(e) alkylbenzenesulfonates of the formula



where R^v is a branched chain or linear alkyl radical having about 9 to about 16 carbon atoms, c is an integer from 1–3 inclusive and A is as defined above, and mixtures of any two or more thereof.

4,574,135

Patent Not Issued For This Number

4,574,136

PLASTICIZED POLYVINYL BUTYRAL INTERLAYERS

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 15, 1983, Ser. No. 523,305

Int. Cl.[4] C08L 91/00; C08K 5/10

U.S. Cl. 524—310 5 Claims

1. In a polyvinyl butyral sheet plasticized with a multiester of an alcohol having 2 to 4 hydroxyl groups and a C_{16} to C_{20} unsaturated fatty acid having a hydroxyl group attached to the acid molecule, the improvement which comprises, in property-improving combination with such multiester, a synergistically effective amount of a monoester of a glycol and said C_{16} to C_{20} unsaturated fatty acid, wherein the ratio of said monoester to said multiester is between about 1:1 to about 5:1.

4,574,137

PROCESS FOR PREPARING COPOLYMER POLYOLS

John F. Serratelli, Lake Jackson, and Michael A. Norton, Friendswood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 23, 1984, Ser. No. 643,517

Int. Cl.[4] C08F 216/02, 216/14, 220/26, 2/42

U.S. Cl. 524—724 14 Claims

1. In a process for preparing a polymer polyahl comprising polymerizing an ethylenically unsaturated monomer or mixtures thereof in a polyahl or polyahl mixture whereby a dispersion of polymer particles is prepared in a continuous polyahl phase, the improvement comprising conducting said polymerization in the presence of a halogen selected from chlorine, bromine and iodine, an interhalogen in which the atoms are selected from chlorine, bromine or iodine or an iodine-releasing inorganic compound, said halogen, interhalogen or iodine-releasing inorganic compound being present in an amount sufficient to provide improved stability to said copolymer polyahl.

8. The improved process of claim 1 wherein the polyahl or polyahl mixture contains graft polymerization sites.

9. The improved process of claim 8 wherein the polyahl or polyahl mixture contains purposefully introduced ethylenic unsaturation.

10. The improved process of claim 9 wherein the polyahl or polyahl mixture comprises the reaction product of a polyahl and a difunctional compound having an additional polymerizable ethylenically unsaturated group and another functional group which reacts with a polyahl to form a bond between the difunctional compound and the polyahl.

12. The improved process of claim 10 wherein the difunctional compound is an ethylenically unsaturated isocyanate.

4,574,138

RAPID CURE ACRYLIC MONOMER SYSTEMS CONTAINING ELEMENTAL ALUMINUM METAL

James P. Moran, Jr., 30 Paper Chase Dr., Farmington, Conn. 06032, and Mark Holmes, 46 Wintergreen Dr., Quaker Hill, Conn. 06375

Filed Jan. 9, 1984, Ser. No. 568,311
Int. Cl.[4] C08K 3/08
U.S. Cl. 524—786 39 Claims

1. A polymerizable composition comprising, in combination:

(1) at least one polymerizable acrylic monomer system comprising a urethane acrylate monomer having vinyl reactive ends, and at least one hydroxy-terminated, monofunctional, short-chain monomer which is soluble in or miscible with the urethane acrylate monomer;

(2) an effective amount for initiation of a free radical initiator; and

(3) a compatible, powdered filler material comprising elemental (atomized) aluminum metal powder in an amount in the range of from about 20% to about 70% by weight of the total composition,

said composition being further characterized by the ability to achieve handling strength in 3 to 10 seconds.

4,574,139

POLYMER HAVING A FLUORINE-CONTAINING END GROUP AND PRODUCTION OF THE SAME

Toshiaki Sato; Junnosuke Yamauchi, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 25, 1984, Ser. No. 614,158
Claims priority, application Japan, Jun. 17, 1983, 58-109798; Jun. 17, 1983, 58-109799
Int. Cl.[4] C08F 8/18
U.S. Cl. 525—61 10 Claims

1. A polymer having an organic fluorine-containing group only at the end of said polymer represented by the formula

$$R_f\text{—}(X)_m\text{—}S\text{—}P$$

wherein m is 0 or 1 and R_f is:

(a) a fluorinated alkyl group which is represented by

$$A\text{—}(CF_2\text{—})_q$$

wherein A is hydrogen, fluorine, $(CF_3)_2CH$, or $(CF_3)_2CF$ and q is 2-20; or

(b) a fluorinated alkyl ether group which is $(CF_3)_2$—C-F—O—$(CF_2)_q$ wherein q is 2-20, or $(CF_3)_2$—C-F—O—$[CF(\text{—}CF_3)\text{—}CF_2\text{—}O\text{—}]_tCF(\text{—}CF_3)$, wherein t is 1 to 10;

wherein P is a polymeric base formed from a monomer capable of radical polymerization, said monomer being represented by

wherein

R_1 is hydrogen, a C_{1-10} alkyl group, halogen, or aryl group;

R_2 is hydrogen or CH_2=CH—;

R_3 is hydrogen, a C_{1-10} alkyl group, halogen, or CN; and

R_4 is hydrogen, a hydroxyl group, C_{1-10} alkyl group, C_{1-20} acyloxy group, halogen, aryl group, CN, or COOH or a salt, ester, or amide thereof; and

wherein X is a group that links R_f to S.

4,574,140

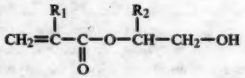
GREEN STRENGTH OF ELASTOMERS

Paul H. Sandstrom, Tallmadge, and Emil M. Friedman, Cleveland Heights, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 27, 1983, Ser. No. 508,297
Int. Cl.[4] C08L 9/00; C08F 236/02
U.S. Cl. 525—123 14 Claims

1. A process for forming a synthetic elastomer copolymer having improved green strength comprising reacting at least one type of a synthetic elastomer forming monomer with a hydroxyl containing monomer,

said synthetic elastomer forming monomer selected from the class consisting of (1) at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms, and (2) at least one type of an olefin monomer having from 2 to 14 carbon atoms in combination with at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms, wherein the amount of said olefin monomer by weight to the total weight of the copolymer of the diene and olefin ranges from about 1.0 percent to about 55 percent, said hydroxyl containing monomer having the formula



wherein R_1 and R_2 are either hydrogen or a methyl group and the amount of said hydroxyl monomer in said copolymer ranges from about 0.5 percent to about 75 percent by weight based upon the total weight of said hydroxyl containing monomer and synthetic elastomer forming monomer in said elastomer copolymer.

2. The process of claim 1 wherein said synthetic elastomer copolymer is partially crosslinked by adding and reacting from 0.1 to 10.0 parts by weight of a diisocyanate crosslinking agent, based upon 100 parts of said copolymer,

wherein said diisocyanate is selected from the class consisting of aliphatic diisocyanates containing 2 to 16 carbon atoms, cycloaliphatic diisocyanates containing from 6 to 16 carbon atoms, aromatic diisocyanates containing 6 to 16 carbon atoms and combinations thereof.

4,574,141

METHOD FOR PRODUCING GRAFT-COPOLYMERS OF VINYL CHLORIDE AND POLYFLUORINE RESIN BY COPOLYMERIZATION

Cheng-Yi Cheng; Shou-Yuan Lee; Kwang-Ming Chen, and Chee-Yuan Wo, all of Kao Hsiung City, Taiwan, assignors to Formosa Plastics Corporation, Taipei, Taiwan

Filed Jun. 15, 1984, Ser. No. 621,103
Int. Cl.[4] C08F 259/08
U.S. Cl. 525—252 12 Claims

1. A method of graft copolymerization of vinyl chloride and polyfluorine resin comprising the steps of

(a) heating to about 90° C. vinyl chloride monomer and polyfluorine resin in an alkaline solution under stirring conditions the ratio by weight of polyfluorine to vinyl chloride being greater than 0 and up to 1;

(b) subsequently cooling the alkaline solution to room temperature;

(c) adding a suspension agent, diluting with water and adding an initiator;

(d) stirring the resultant mixture to a substantially homogenized state;

(e) heating the resultant homogenized reaction mixture to a graft copolymerization temperature to substantially complete graft copolymerization of vinyl chloride and the polyfluorine resin; and

(f) neutralizing, washing and drying the polymerized mixture.

4,574,142

CURABLE ADHESIVE COMPOSITION TOUGHENED WITH STYRENE-BUTADIENE BLOCK COPOLYMER RUBBERS

Ronald S. Charnock, Celbridge, Ireland, assignor to Loctite (Ireland) Ltd., Dublin, Ireland

Continuation-in-part of Ser. No. 503,073, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 281,264, Jul. 8, 1981, abandoned. This application Oct. 11, 1984, Ser. No. 659,753
Claims priority, application Ireland, Jul. 11, 1980, 1449/80
Int. Cl.[4] C08F 279/00
U.S. Cl. 525—305 14 Claims

1. A curable composition produced by mixing or contacting an activator component with a polymerizable component, the composition characterized in that it consists of said activator and said polymerizable components; said activator and polymerizable components are intermixed or in contact with each other so as to form an activated composition; both said components of said activated composition are free of organic sulfonyl chloride compounds; and said polymerizable component comprises a polymerizable acrylic ester monomer, at least 33% by weight of a styrene-butadiene block copolymer rubber, an adhesion promoter and a free radical catalyst system comprising a free radical initiator.

4,574,143

AMINE CURING AGENTS AND EPOXY RESINS CURED THEREWITH

Kathy B. Sellstrom, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 510,696, Jul. 5, 1983, abandoned. This application Nov. 9, 1984, Ser. No. 670,171
Int. Cl.[4] C08L 67/00
U.S. Cl. 525—438 37 Claims

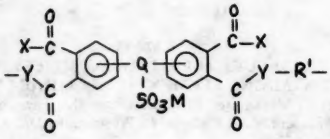
1. A composition for use in the curing of a 1,2-epoxy resin consisting essentially of a solution of an at least partially degraded normally solid secondary amide-containing polyethylene terephthalate in an amine curing agent.

4,574,144

SULFONATED POLYIMIDES AND POLYAMIC ACIDS AND METHOD FOR THEIR PREPARATION

John B. Yates, III, Clifton Park, and David J. Smith, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,202
Int. Cl.[4] C08L 77/12
U.S. Cl. 525—435 17 Claims



1. A sulfonated polymer comprising structural units having formula I in the drawings, wherein M is one equivalent of a cation; Q is a divalent radical comprising at least one aromatic ring substituted with at least one activating group toward electrophilic aromatic substitution; R^1 is an aromatic hydrocarbon radical containing about 6–20 carbon atoms or a halogenated derivative thereof, an alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or a bis-alkylenepoly(dialkylsiloxane) radical; X is OH and Y is NH, or X and Y taken together are N.

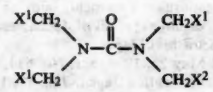
4,574,145

EPOXY CURING AGENTS AND METHOD FOR MAKING THEM

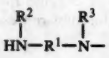
Lowell O. Cummings, San Anselmo, Calif., assignor to Chemcrete International, Belmont, Calif.

Continuation-in-part of Ser. No. 396,319, Jul. 8, 1982, Pat. No. 4,490,510. This application Sep. 28, 1984, Ser. No. 656,140
Int. Cl.[4] C08G 8/28; C08L 61/24, 61/34
U.S. Cl. 525—509 25 Claims

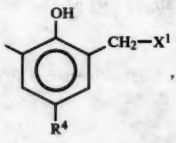
1.



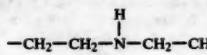
where X^1 is

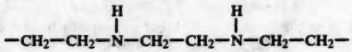


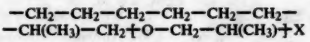
and X^2 is X^1 or



where R^1 is one of the following:

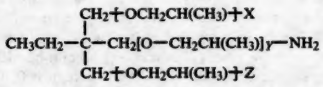
(a) 

(b) 

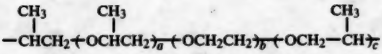
(c) 

(d)

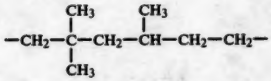
x varying from about 2 to about 6

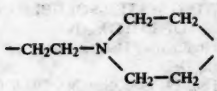
(e) 

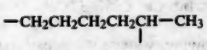
where X+Y+Z=5.3

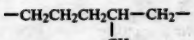
(f) 

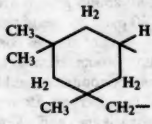
where a+c=3.5
and b=13.5

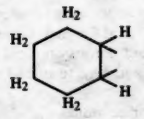
(g) 

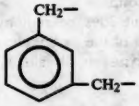
(h) 



(i) 

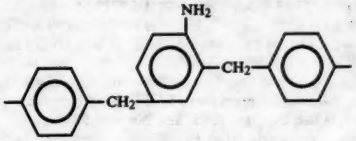




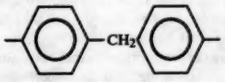
(j) 

(k)

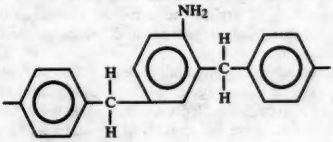
-continued

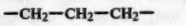
(n) 

(o) mixture of



and



(p) 

R^2 and R^3 are both H where R^1 is any of (a) to (o) and when R^1 is (p), either R^2 or R^3, but not both, is $C_{18}H_{35}$, while the other is H, and
R^4 is H or an alkyl radical with one to nine carbon atoms.

(i) **4,574,146**

THERMOSETTING COATING COMPOSITION USEFUL AS PRIMER AND CHIP RESISTANT PRIMER II'

(j) **Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Fraser, and Dennis J. Grebur, Berkley, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

Filed Jul. 5, 1983, Ser. No. 510,799

(k) **The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.**

Int. Cl.⁴ C08G *59/16*

U.S. Cl. 525—530 **14 Claims**

(l) 1. A novel, epoxy-polyester graft copolymer adapted for use in a thermosetting composition, which copolymer has a number average molecular weight (Mn) of between about 2,000 and about 20,000, said copolymer being prepared by polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having a number average molecular weight (Mn) of between about 1,000 and about 4,000 and being formed by reacting diepoxide, which has been chain extended with dicarboxylic acid, with hydroxy functional secondary amine in chain terminating reaction in approximately 1 to 1 equivalent ratio, wherein said polymerization of said lactone monomers is carried out at a temperature between about 130° C. and about 200° C. and the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 20 and about 90 weight percent said lactone monomers.

4,574,147

PROCESS FOR THE PRODUCTION OF POLYURETHANES, POLYURETHANES CONTAINING TERMINAL AROMATIC AMINO GROUPS AND THEIR USE

Walter Meckel, Neuss, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1985, Ser. No. 691,593

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401753

Int. Cl.[4] C08G *18/10*

U.S. Cl. 528—64 11 Claims

1. A process for the production of a crosslinkable, predominately linear polyurethane containing terminal aromatic amino groups which comprises reacting

(A) an organic, substantially difunctional polyisocyanate,

(B) a substantially difunctional polyhydroxyl compound having a molecular weight of 400 to about 6000 and/or

(C) a substantially difunctional chain-extending agent having a molecular weight of 18 to about 399 and

(D) a chain-terminating agent comprising a member from the group consisting of araliphatic diamines and aromatic diamines containing amino groups of different reactivity to NCO-groups, in

(E) solvents which are substantially inert to the reactants,

in a single-stage or multistage reaction, characterized in that component (A) is reacted with component (B) and/or (C) in an NCO:isocyanate-reactive group ratio of about 1.15:1 to 1.02:1 to form a polyurethane containing terminal NCO-groups, having a molecular weight of at least 10,000 and an NCO-content of $\leqq$0.2 equivalents and $\geqq$0.001 equivalents of NCO/1000 g of polyurethane, and said polyurethane is subsequently reacted with chain-terminating agent (D) in an NCO:NH_2-ratio of about 1:5 to 1:1.66 to form polyurethanes containing terminal aromatic amino groups.

4,574,148

POLYESTER RESINS CAPABLE OF FORMING CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Thomas H. Wicker, Jr., and Robert B. Barbee, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,608

Int. Cl.[4] C08G *63/18, 63/66*

U.S. Cl. 528—173 14 Claims

1. A polyester composition capable of being formed into molded containers having good gas barrier properties comprising the reaction product of

(A) a diol containing up to about 8 carbon atoms, and

(B) a diacid component comprising

(i) about 5 to 95 mole percent of at least one first diacid selected from the group consisting of [thiobis(p-phenyleneoxy)]diacetic acid, [sulfonylbis(p-phenyleneoxy)]diacetic acid, and mixtures thereof, and

(ii) 5 to about 95 mole percent of naphthalene dicarboxylic acid,

wherein said polyester has an inherent viscosity of about 0.5 to 1.5.

4,574,149

FLUORINATED ORGANOSILOXANE COPOLYMERS

Chi-Long Lee; Thomas F. Lim, both of Midland, and Antony P. Wright, Rhodes, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 664,897

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[4] C08G *77/24*

U.S. Cl. 528—42 5 Claims

1. A resinous, benzene-soluble organosiloxane copolymer consisting essentially of (a) repeating units of the formulae $SiO_{4/2}$; $R(CH_3)_2SiO_{\frac{1}{2}}$; and units of the general formula $R'CH_2CH_2Si(R'')_nO_{(3-n)/2}$ where R represents a saturated or ethylenically unsaturated hydrocarbon radical containing from 1 to 4 carbon atoms or a phenyl radical, R' represents a monovalent organic group containing at least 4 perfluorinated carbon atoms, R'' represents an alkyl radical containing from 1 to 3 carbon atoms or a phenyl radical; (b) silicon-bonded hydroxyl groups; and, optionally (c) R_2SiO units; n is 0, 1 or 2, the molar ratio of all units in the copolymer other than silicon-bonded hydroxyl groups and $SiO_{4/2}$ units to said $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of silicon-bonded hydroxyl groups in said copolymer is up to 4.0% by weight.

4,574,150

DRY FREE-FLOWING WATER-SOLUBLE COMPLEXES OF CHITOSAN

Paul R. Austin, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Feb. 19, 1985, Ser. No. 703,070

Int. Cl.[4] C08B *37/08*

U.S. Cl. 536—20 8 Claims

5. A dry, free-flowing, water-soluble carboxylic acid complex of chitosan prepared according to a process comprising the steps of:

(A) combining to form a mixture;

(1) one part by weight of particulate chitosan in which at least about 70% of all amino groups are deacetylated;

(2) one-half to about 30 parts by weight of a liquid selected from the group consisting of alkanes containing about five to about nine carbon atoms, monoketones, monoesters, mono- and di-ethers, mononitriles, and mononitroalkanes containing two to four carbon atoms, normally liquid mono- and poly-chloroalkanes and alkenes containing one to two carbon atoms; and

(3) from about 0.1 to about 30 equivalents of a normal or iso-monocarboxylic acid for each amino group equivalent in said chitosan, said carboxylic acid containing one to four carbon atoms and zero to one of the groups (a), (b), (c) consisting of:

(a) one to two chlorine atoms;

(b) one keto group;

(c) one hydroxyl group;

(4) from zero to about 30% percent by weight of water based on the weight of the carboxylic acid;

(B) maintaining said mixture until said chitosan is rendered water-soluble;

(C) recovering and drying said water-soluble carboxylic acid complex of chitosan at a temperature below the denaturation temperature.

4,574,151

AMINE SALTS AND PRODUCTS CONTAINING THEM

Brian W. Adams, Newtown Abbey, Northern Ireland, assignor to Peter Robin Broughton Lawrence, London, England

Filed Aug. 11, 1983, Ser. No. 522,413

Claims priority, application United Kingdom, Aug. 20, 1982, 8223983

Int. Cl.[4] C08B *15/06*

U.S. Cl. 536—31 12 Claims

1. A water soluble salt formed between a naturally occurring polysaccharide polymeric acid modified to increase the average number of acid groups per saccharide unit and at least 40% (by weight of the salt) of an alkaloid.

4,574,152

CEPHALOSPORIN COMPOUNDS

David Noble, Slough, England, assignor to Glaxo Group Limited, London, England

Filed Jan. 14, 1983, Ser. No. 457,940

Claims priority, application United Kingdom, Jan. 15, 1982, 8201139

Int. Cl.[4] C07D *501/02*

U.S. Cl. 544—4 12 Claims

1. A ternary complex comprising a 7-[D-5-amino-5-carboxypentanamido]cephalosporin complexed with copper (II) ions and an organic nitrogen base containing from 6 to 15 carbon atoms selected from aliphatic primary amines, aromatic amines, nitrogen heterocyclic compounds and aralkyl primary amines having at least two carbon atoms in the alkyl moiety.

4,574,153

8-OXO-2-OXA-1-AZABICYCLO(4.2.0)OCTANE-3-CARBOXYLIC ACIDS

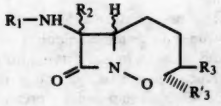
David Kronenthal, Yardley, Pa.; Paula L. Kuester, West Trenton, and William H. Koster, East Amwell Township, Hunterdon County, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 1, 1985, Ser. No. 707,357

Int. Cl.[4] C07D *498/04*

U.S. Cl. 544—63 17 Claims

1. A compound having the formula

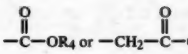


or a pharmaceutically acceptable salt thereof, wherein

R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen, methoxy, or formamido;

one of R_3 and R'_3 is hydrogen and the other is



and

R_4 is hydrogen, alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl;

wherein the term "substituted alkyl" refers to alkyl groups substituted with one, or more, azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (4, 5, 6 or 7-membered heterocycle)oxy, alkylsulfinyl or alkylsulfonyl groups; and

the term "substituted phenyl" refers to phenyl substituted with 1, 2 or 3 halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms groups.

4,574,154

TRIAZINE ADDITION COMPOUNDS

Hidemasa Okamoto; Mitsuo Yamanaka, and Kazuyoshi Fujii, all of Hirakata, Japan, assignors to Ube Industries, Ltd., Ube, Japan

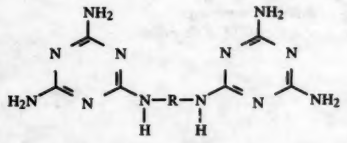
Filed Dec. 28, 1983, Ser. No. 566,195

Claims priority, application Japan, Dec. 28, 1982, 57-227979; Apr. 7, 1983, 58-59958

Int. Cl.[4] C07D *403/14*

U.S. Cl. 544—192 25 Claims

1. A triazine addition compound consisting essentially of one mole of a triazine derivative having the formula (I):



(I)

in which R is a divalent hydrocarbon residue containing 1–12 carbon atoms,

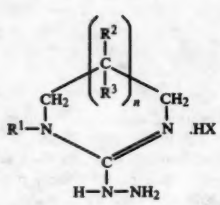
and one or two moles of one or two compounds selected from the group consisting of cyanuric acid and isocyanuric acid.

4,574,155
PROCESS FOR PREPARING 2-HYDRAZINO-1,3-DIAZACYCLOALK-2-ENE HYDROHALIDES

Thurairajah Padmanathan, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 8, 1984, Ser. No. 587,414
Int. Cl.[4] C07D *239/02, 109/04*
U.S. Cl. 544—330 16 Claims

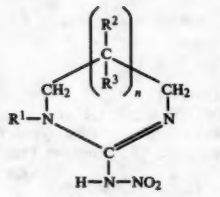
1. A process for preparing a compound of formula (I)



(I)

wherein R^1 is hydrogen, C_1–C_6 alkyl, C_1–C_6 hydroxyalkyl, C_1–C_6 alkoxyalkyl, phenyl, substituted phenyl, benzyl, or substituted benzyl, R^2 and R^3 are independently hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxyalkyl, hydroxyl, phenyl, substituted phenyl, benzyl and substituted benzyl, with the proviso that none of the substituted radicals contain a halo, sulfidyl, nitro or ring keto group, and n is an integer from 0 to 3, comprising:

reacting a one molar proportion of a compound of formula (II)

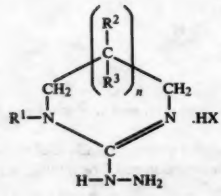


(II)

wherein R^1, R^2, R^3 and n are as defined above with about an equimolar proportion of an ammonium halide or hydrazonium halide, and about 1 to 2 molar proportions of hydrazine hydrate in a composition selected from a C_1 to C_4 aliphatic alcohol, water or a mixture thereof, at a temperature from about ambient to the reflux, and isolating the compound of formula (I).

11. A process for preparing a 2-hydrazino-1,3-diazacycloalk-2-ene dihydrohalide comprising:

reacting a compound of the formula



(I)

wherein R^1 is hydrogen, C_1–C_6 alkyl, or C_1–C_6 hydroxyalkyl, R^2 and R^3 are independently hydrogen or C_1–C_6 alkyl, n is 0 to 3 and X is a halide ion, with hydrogen halide wherein the halide ion is the same as defined above in a C_1–C_4 alkyl alcohol at about 0° to 30° C.; and

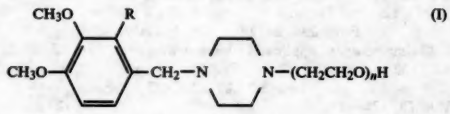
recovering the corresponding 2-hydrazino-1,3-diazacycloalk-2-ene dihydrohalide.

4,574,156
POLYMETHOXYBENZYL PIPERAZINE DERIVATIVES EFFECTIVE FOR IMPROVING BLOOD CIRCULATION SYSTEM

Masao Morita, Hirakata; Jiro Sugimoto, Yao; Komei Mizuno, Takatsuki; Motoaki Tanaka, Urawa, and Fumiyoshi Urano, Niiza, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 7, 1984, Ser. No. 679,346
Claims priority, application Japan, Dec. 10, 1983, 58-233404
Int. Cl.[4] C07D *295/00*; A61K *31/495*
U.S. Cl. 544—398 6 Claims

1. A compound of the formula:



(I)

wherein R is hydrogen or a methoxy group; and n is an integer of 2 to 5, or a pharmaceutically acceptable acid addition salt thereof.

4,574,157
PROCESS FOR PREPARING ANHYDROUS CYCLIC IMIDO ESTERS

Walter K. Homann, Düilmen, Fed. Rep. of Germany, assignor to Chemische Werke Huels, AG, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,621
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224880
Int. Cl.[4] C07D *263/04, 263/08*
U.S. Cl. 548—239 12 Claims

1. In a process for preparing an anhydrous cyclic imido ester by reacting a nitrile with an amino alcohol, in the presence of a metal compound as catalyst, and driving off resultant ammonia, the improvement comprising effecting the reaction at a temperature of 90°–230° C. and under a pressure of 1.1–10 bar.

4,574,158

ACETAL PURIFICATION USING PHASE TRANSFER CATALYSTS

Jeff T. Fenton, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 1, 1982, Ser. No. 438,071

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.[4] C07D *321/00*

U.S. Cl. 549—347 7 Claims

1. A method for purifying acetals comprising

(1) placing acetals in a molten state

(2) contacting said acetals with alkali metal hydroxide and a phase transfer catalyst for a time sufficient to reduce impurities present, and

(3) recovering the purified acetal

4,574,159

PROCESS FOR THE PREPARATION OF O-METHYL-N-VINYLURETHANE

Jürgen-Rolf Hassdenteufel, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,571

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319451

Int. Cl.[4] C07C *125/065*

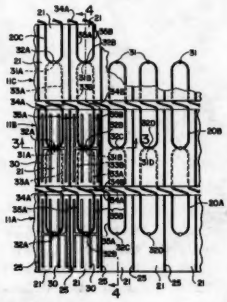
U.S. Cl. 560—157 14 Claims

1. A process for the preparation of O-methyl-N-vinylurethane which comprises subjecting a composition consisting essentially of N-alpha-methoxyethyl-O-methylurethane to pyrolysis in a tube reactor and cooling the resultant pyrolysate, wherein substantially pure O-methyl-N-vinylurethane is separated out from said pyrolysate and the resultant mother liquor is passed to a new pyrolysis and wherein methanol is added on to the resultant mother liquor in the presence of a base.

4,574,160
FLEXIBLE, ROLLABLE PHOTOVOLTAIC CELL MODULE

Ronald C. Cull, Milan; Robert A. Hartman, and Paul E. Koch, both of Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 28, 1984, Ser. No. 656,175
Int. Cl.⁴ H01L *25/02*
U.S. Cl. 136—245 **26 Claims**



1. A photovoltaic module comprising:

busbar means;

a plurality of individual photovoltaic cell strips, each said cell strip having an electrically conductive substrate layer, a semiconductor body deposited on said substrate layer, and a transparent electrically conductive layer deposited on said semiconductor body, said transparent electrically conductive layer being selectively sectioned to define a plurality of electrically distinct photovoltaic cells carried by said cell strip;

grid means deposited on said transparent electrically conductive layer of each said photovoltaic cell;

continuous electrically conductive filament means alternately and repetitively connected, at contact points, to said electrically conductive substrate layer of one said photovoltaic cell strip and to said grid means of another said photovoltaic cell strip, wherein said filament means is connected medially of the lateral edges of said respective cell strips; and

means for connecting said transparent electrically conductive layer of one said photovoltaic cell strip to said busbar means.

26. A flexible photovoltaic array roll comprising:

a plurality of longitudinally spaced flexible photovoltaic modules, wherein said photovoltaic modules comprise busbar means, a plurality of individual photovoltaic cell strips, each said cell strip having an electrically conductive substrate layer, a semiconductor body deposited on said substrate layer, and a transparent electrically conductive layer deposited on said semiconductor body, said transparent electrically conductive layer being selectively sectioned to define a plurality of electrically distinct photovoltaic cells carried by said cell strip, grid means deposited on said transparent electrically conductive layer of said photovoltaic cell, continuous electrically conductive filament means alternately and repetitively connected, at contact points, to said electrically conductive substrate layer of one said photovoltaic cell strip and to said grid means of another said photovoltaic cell strip, said filament means including a first stress relief region proximate to a said contact point on one said cell strip, a second stress relief region proximate to a said contact point on a next adjacent said cell strip, and a third stress relief region interposed between said second and third stress relief regions and, means for connecting said transparent electrically conductive layer of one said photovoltaic cell strip to said busbar means;

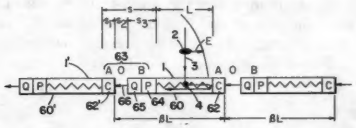
means for receiving electrical energy from said modules; and

means which encapsulate said modules and said means for receiving.

4,574,161
ORDERED DIPOLAR LIGHT-ELECTRIC POWER CONVERTER

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Continuation-in-part of Ser. No. 637,405, Aug. 3, 1984, which is a continuation-in-part of Ser. No. 462,240, Mar. 2, 1983, which is a continuation-in-part of Ser. No. 330,791, Dec. 15, 1981, Pat. No. 4,445,050, and a continuation-in-part of Ser. No. 596,428, Apr. 3, 1984, which is a continuation-in-part of Ser. No. 222,377, Jan. 5, 1981, Pat. No. 4,442,019, which is a continuation of Ser. No. 909,944, May 26, 1978, abandoned. This application Sep. 14, 1984, Ser. No. 650,708
Int. Cl.⁴ H01L *31/04*
U.S. Cl. 136—263 **13 Claims**



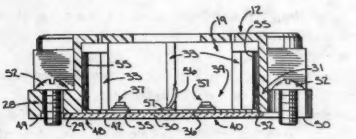
1. A light/electric power converter comprising a sheet-iike volume, a plurality of elongated light-absorbing electrically-conducting particles in said sheet, said elongated particles being linearly arranged along an axis in strings; said light energy being converted to energetic electrons in said strings, asymmetric junctions interspersed and connected to said particles

in said strings, said asymmetric junctions passing said electrons in only one direction along said conducting strings; said strings being substantially parallel, a first electrode and a second electrode connected to a first terminal and a second terminal respectively; said particle strings being normal to and between said first and second electrodes, a load, said load being connected between said first and second terminals, whereby light power is converted in said sheet to electric power and delivered to said load.

4,574,162
COMPACT CIRCUIT PACKAGE WITH IMPROVED CONSTRUCTION FOR CLAMPING TO ENHANCE HEAT TRANSFER

Lance R. Kaufman, 131 W. White Oak Way 96N, Mequon, Wis. 53092

Division of Ser. No. 362,498, Mar. 26, 1982, Pat. No. 4,449,292. This application Feb. 6, 1984, Ser. No. 577,205
Int. Cl.⁴ H01L *23/40*
U.S. Cl. 174—16 HS **1 Claim**



1. A compact circuit package with improved construction for clamping to enhance heat transfer, comprising

an insulating housing providing a circuit retaining cavity including a base surface surrounded by a peripheral side wall having

a first pair of spaced side wall portions each terminating at a first rim located substantially within a first plane and

a second pair of spaced side wall portions each terminating at a second rim located substantially within a second plane spaced from said first plane

with said first and second rims surrounding an opening into said cavity and each of said first and second side wall portions containing an abutment to limit the depth of entry into said cavity,

a heat conducting electrically insulating substrate located within said opening and engaging said abutments to substantially enclose said cavity and including

a first side facing said cavity and containing a heating generating electrical component and

an oppositely disposed second side located substantially within a third plane substantially co-extensive with at least one of said first and second planes

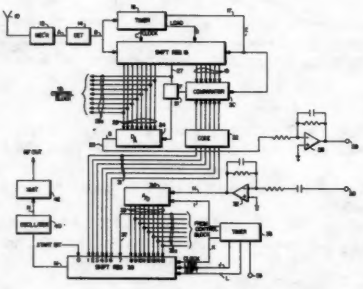
to form a clamping surface including said substrate second side and at least one pair of said first and second rims to permit said clamping surface to be clamped against an external heat dissipating object by clamping pressure being distributed along said substrate second side and at least one pair of said first and second rims to permit increased substantial clamping pressure without damaging said substrate and said side walls.

4,574,163

DIGITAL RADIO TELEPHONE

Thomas J. Zato, Palatine, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 22, 1983, Ser. No. 554,424
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 179—2 EA **5 Claims**



1. A method of wireless communication between a base station and a remote station in a radio telephone system comprising the steps of:

assigning fixed digital identification addresses to said base station and to said remote station;

converting audio data information and function data information to be transmitted between said stations into digital data; and

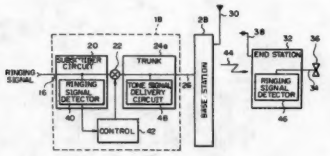
transmitting said digital data in packets, each packet including an identification address, an audio/function signal for identifying said audio data and said function data and either said audio data information or said function data information.

4,574,164

RINGING SIGNAL TRANSMISSION SYSTEM FOR RADIOTELEPHONE SYSTEM

Hiromi Orikasa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,296
Claims priority, application Japan, Sep. 26, 1983, 58-178684
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 179—2 EB **2 Claims**



1. In a radiotelephone system comprising a telephone switching network which includes a telephone exchange for sending a ringing signal, at least one base station connected to the telephone switching network, and a plurality of end stations each being provided with a telephone, wherein a multichannel access radio section is set up between the base station and each of the end stations and the telephone at each of the end stations produces a calling tone in synchronism with a ringing signal after the ringing signal from the telephone exchange is transmitted over the radio section, a ringing signal transmission system comprising:

trunk circuits connected between the base station and the telephone exchange in correspondence with channels of the radio section; and

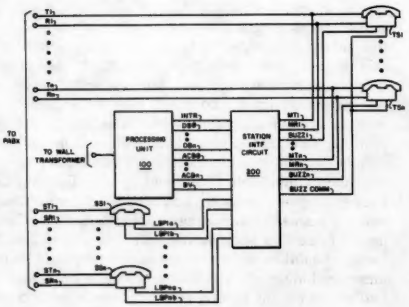
a tone signal generator circuit called by the telephone exchange to generate a calling tone signal for a predetermined period of time immediately after the completion of a connection of the radio section for a call to be received by one of the end stations, with no regard to a ringing signal to be delivered from the telephone exchange, said calling tone signal being transmitted to said one end station.

4,574,165

SECRETARIAL ANSWERING SYSTEM

Louis W. Smith, St. Petersburg, Fla., and Janos I. Csapo, Oakton, Va., assignors to GTE Business Communication Systems Inc., Northlake, Ill.

Filed Oct. 11, 1983, Ser. No. 540,463
Int. Cl.[4] H04M *3/50, 3/58*
U.S. Cl. 179—18 BD **14 Claims**



1. A secretarial telephone answering system for use with a telephone switching system including a switching center, and both a secretarial telephone station and a plurality of subscriber

telephone stations all connected to said switching center, said switching center being operative to apply a ringing signal to a called subscriber station, said subscriber stations being operative to provide busy and idle conditions, and said secretarial station being operative to provide a buzzing requested message, including a code identifying said called subscriber station, said telephone answering system comprising:

a processing unit connected to said secretarial station; and

a plurality of line circuits each connected to said processing unit and an associated one of said subscriber stations;

each of said line circuits being operative in response to detection of said busy or idle condition, or ringing signal at an associated called subscriber station to provide a busy, idle or ringing detected signal, respectively;

said processing unit being operative to periodically scan said line circuits for said busy, idle and ringing detected signals and upon detection thereof, being operative to apply to said secretarial station busy, idle or ringing detected messages, respectively, each including a busy, idle or ringing detected code, respectively, and a code identifying an associated subscriber station;

said processing unit being further operative in response to said buzzing requested message to apply a buzzing control signal to the line circuit associated with said called subscriber station; and

said line circuit being operative in response to said buzzing control signal to apply a buzzing signal to said called subscriber station.

4,574,166

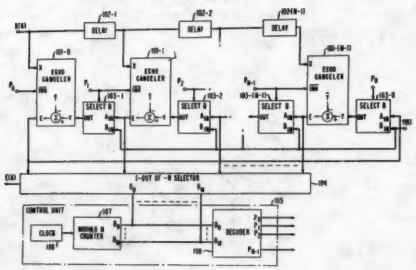
TANDEM ADAPTIVE FILTER ARRANGEMENT

Charles W. K. Gritton, North Brunswick, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1983, Ser. No. 464,029

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 179—170.2 **13 Claims**



7. Apparatus comprising:

a plurality of adaptive echo cancelers, each including a receive input, a transmit input and a transmit output;

means for switchably connecting said transmit inputs and transmit outputs of said plurality of adaptive echo cancelers in a tandem arrangement; and

means for controlling switching of said transmit inputs and transmit outputs of said adaptive echo cancelers so that the relative positions of said adaptive echo cancelers are switched in said tandem arrangement at a predetermined rate.

4,574,167

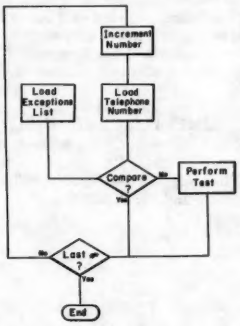
METHOD AND APPARATUS FOR CONFIGURABLE LINE TESTING

David J. Olek, Victor, N.Y., assignor to TII Computer Systems, Inc., Copiague, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,461

Int. Cl.⁴ H04B *3/46*

U.S. Cl. 179—175.3 R **2 Claims**



2. Apparatus for testing telephone lines in numerical order without the need to access certain telephone lines in such order comprising:

means for storing an exceptions list which identifies each line that is not to be tested,

means for storing a record of the next telephone line to be tested,

means for comparing said record against said exceptions list, and

means for incrementing said record if the next line to be tested appears on the exceptions list and comparing the incremented record with the exceptions list or for initiating a test of that telephone line when a number is reached that does not appear on the exceptions list.

4,574,168

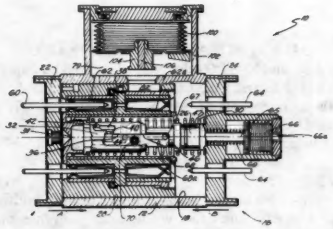
MULTIPLE-STAGE INTEGRATING ACCELEROMETER

Howard F. Devaney, Cedar Crest, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,326

Int. Cl.⁴ H01H *35/14;* **F42C** *15/24*

U.S. Cl. 200—61.53 **18 Claims**



1. An accelerometer assembly for use in activating a switch or the like responding to multiple acceleration pulses in series, comprising:

a housing forming a chamber having a first and second end;

a mass slidably disposed in said chamber and movable during acceleration from said first end toward said second end;

means for biasing said movable mass toward a reset position adjacent said first end;

means for damping the movement of said mass in said chamber;

cam and follower means carried by said movable mass and said housing for relative movement in response to said acceleration, said cam and follower means including means for temporarily blocking the mass movement toward said second end after a first acceleration pulse;

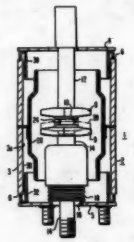
said cam and follower means cooperating together to allow continued movement toward said second end and switch activation in response to at least a second separate acceleration pulse in series with the first.

4,574,169

BIMETALLIC ARC SHIELD

Vincent J. Santilli, Corning, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 647,205
Int. Cl.⁴ H01H *33/66*
U.S. Cl. 200—114 B **2 Claims**



1. A vacuum type circuit interrupter including in combination, means for defining an evacuated envelope, a pair of separable contacts disposed within the evacuated envelope and separable to establish arcing, a vapor condensing arc shield provided interiorly within said evacuated envelope to prevent deposition of metallic particles emitted from the arcing region onto the means defining the evacuated envelope, said vapor condensing arc shield being bimetallic and consisting of a first layer of copper and a second layer of a relatively high breakdown voltage material, said material being selected from the group consisting of stainless steel and steel, one major surface of said copper layer facing toward said arcing region of said interrupter, said layer of high breakdown voltage material being affixed to a second major surface of said copper layer over the entire length of said shield, said second major surface of said copper layer being opposed to said one major surface of said copper layer.

4,574,170

MULTI-POLAR CIRCUIT BREAKER

Ken-ichi Abe, and Ryoji Ozaki, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 508,050, Jun. 27, 1983, abandoned. This application Aug. 20, 1984, Ser. No. 642,496
Claims priority, application Japan, Jul. 15, 1982, 57-122131
Int. Cl.⁴ H01H *21/54*
U.S. Cl. 200—153 G **11 Claims**

1. A multi-polar circuit breaker for switching multiple lines, including a neutral line and a voltage-carrying line, in an electrical power system, including:

a neutral-line switching assembly and a voltage-carrying-line-switching assembly;

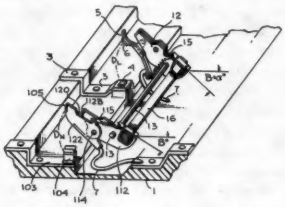
said voltage-carrying-line-switching assembly including a first holder, a first movable contact element carried by said first holder in pivotable relationship thereto, and a first fixed contact element;

said neutral-line-switching assembly including a second holder, a second movable contact element carried by said second holder in pivotable relationship thereto and a second fixed contact element;

said second movable contact element having a first edge remote from said second fixed contact element;

a first stop carried on said second holder for engaging said first edge of said second movable contact element to limit the pivoting of said second contact element in a first direction;

a spring coupled between said second movable contact



element and said second holder for biasing said second movable contact element pivotably towards said first stop;

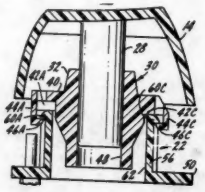
said neutral-line-switching assembly and said voltage-carrying-line-switching assembly being inter-linked by a tie-bar for motion of said holders in unison, said second movable contact element being spaced from said second fixed contact element, in the opened condition of said neutral-line-switching assemlby, a distance less than the spacing of said first movable contact element from said first fixed contact element, in the opened condition of said voltage-carrying-line-switching assembly.

4,574,171

KEYBOARD AUXILIARY BEARING

Ronald S. Denley, Woodstock, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Aug. 3, 1984, Ser. No. 637,266
Int. Cl.⁴ H01H *3/12*
U.S. Cl. 200—340 **13 Claims**



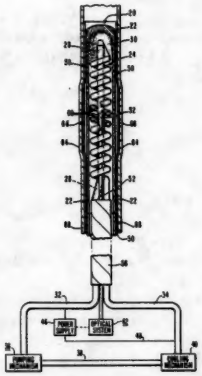
1. In a keyboard having at least one irregularly-shaped keycap mounted on a plunger which is reciprocative along an axis of motion in a main switch housing, the irregular keycap having coupling means attached to its underside, an auxiliary support for preventing binding of the plunger, comprising a bearing having securement means for engaging the coupling means, the securement means allowing relative motion between the bearing and the keycap only in a direction parallel to the plunger axis of motion, and mounting means for attaching the bearing to the keyboard such that the bearing can shift in a plane perpendicular to the plunger axis of motion but cannot skew in a plane parallel to the plunger axis of motion.

4,574,172

BRAZING WAND WITH FIBER OPTIC TEMPERATURE SENSOR

Robert D. Burack, Pittsburgh, Pa., and Rudolph W. Brachold, Waldwick, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 324,910, Nov. 25, 1981, abandoned.
This application Apr. 19, 1984, Ser. No. 602,088
Int. Cl.[4] H05B *6/38*
U.S. Cl. 219—10.49 R 11 Claims



1. Internal heating apparatus for use in steam generator heat exchange tubes, comprising:

an electrically insulating protective member capable of being disposed in a steam generator heat exchange tube;

a hollow electrically conductive tubular member capable of conducting a fluid therethrough and disposed in said protective member, said tubular member having a substantially straight leg and having a portion thereof helically wound around a portion of said straight leg forming an induction coil for heating said tube;

a single strand quartz fiber optic cable disposed within said coil for detecting the temperature of said tube

a two color pyrometer connected to said fiber optic cable for determining the temperature of said tube; and

a power supply electrically connected to said tubular member for supplying an electrical current to said tubular member.

4,574,173

DEVICE FOR RF WELDING AN IV TUBE TO A CATHETER LUMEN

Laurence M. Bennett, Sandy, Utah, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 4, 1984, Ser. No. 607,329
Int. Cl.[4] H05B *6/54*
U.S. Cl. 219—10.53 18 Claims

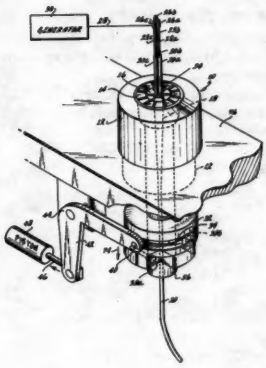
1. A device for RF welding an IV tube to a multilumen catheter comprising:

means cooperative with said catheter for compressively engaging a portion of said IV tube with a dimensionally incompatible portion of a lumen of said catheter;

an electrically conductive mandrel insertable into said IV tube;

an electrical ground associated with said compressive means; and

means connectable with said mandrel for generating RF energy between said mandrel and said ground to weld a



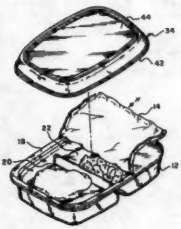
continuous and integral bond at the interface between said IV tube and said catheter.

4,574,174

CONVENIENCE DINNER CONTAINER AND METHOD

Thomas P. McGonigle, 2087 Oakdale, Glenside, Pa. 19038

Filed May 21, 1984, Ser. No. 612,087
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 M 2 Claims



1. A method for providing, storing, and cooking a convenience meal in a either microwave oven or a convectional oven comprising:

(a) assembling a meal for microwave or heat reconstitution in an upside down fashion in a lid having at least one compartment,

(b) installing in the lid as least one vent hole in the compartment located generally under the meal,

(c) covering each vent hole with an adhesive sealing means which prevents the meal from escape and contact with the elements,

(d) covering and sealing each open compartment of the lid with a foil sealing means to protect the meal,

(e) storing the lid with the meal sealed inside, under conditions to protect the freshness of the meal until use,

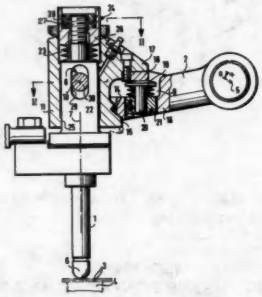
(f) removing the foil to expose the meal,

(g) inverting the lid over a dish of a size such that the lid interfits over the sides of the dish, the dish having a complimentary compartment for each compartment of the lid, wherein the dish is microwavable and of a construction and material suitable for reuse,

(h) removing the adhesive sealing means to expose each vent hole,

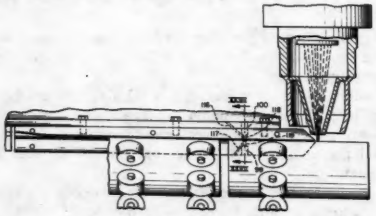
(i) causing the meal in the lid to drop into the dish, and
(j) cooking the meal.

4,574,175
RESISTANCE WELDING APPARATUS
Milenko Jovanovic, Augsburg, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,504
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314646
Int. Cl.[4] B23K *11/10*
U.S. Cl. 219—86.1 27 Claims



1. A resistance welding apparatus, comprising an actuatable pivot arm, a welding electrode carried by said pivot arm, said welding electrode extending at least approximately perpendicularly with respect to the pivot arm and being displaceable within limits with respect thereto against a spring force, and joint means arranged approximately in the electrode axis to enable pivotal movement of the welding electrode with respect to the pivot arm in response to elasticities and bearing play forces in the welding operation.

4,574,176
METHOD AND APPARATUS FOR PULSED HIGH ENERGY DENSITY WELDING
Charles M. Sharp, Mount Arlington, N.J., assignor to SWS Incorporated, Landing, N.J.
Filed Nov. 28, 1983, Ser. No. 555,641
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD 31 Claims

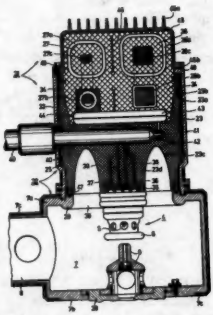


1. A method.of forming a continuous weld at high speed comprising the steps of moving a member to be welded at high speed relative to a pulsed high energy density welding means capable of producing a plurality of short duration pulses of energy having an average power density of at least 10^6 watts/inch^2, forming a continuous weld along said member with a plurality of overlapping welds formed by applying a plurality of short duration pulses of high density energy from said pulses high energy density welding means to said member, detecting the movement of said moving member in the vicinity of said welding means and controlling the pulsing of said pulsed high energy density welding means during said welding in response to the detected movement of said moving member so that the energy for welding from the pulses per unit length of the member is accurately controlled.

4,574,177
PLASMA ETCH METHOD FOR TiO_2
Chung S. Wang, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 344,562, Feb. 1, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 671,027
Int. Cl.[4] B23K *9/00*; G02B *5/14*
U.S. Cl. 219—121 PE 14 Claims

1. A method for selectively etching a layer of TiO_2, comprising the steps of:
(a) providing a layer of TiO_2;
(b) forming a patterned layer of masking material on said TiO_2;
(c) exposing said patterned TiO_2 layer to an atmosphere of a carbohalogen and oxygen at a pressure greater than 0.1 Torr; and
(d) applying RF power to said carbohalogen atmosphere near said TiO_2 layer.

4,574,178
ELECTRON GUN
Helmut Spruck, Gilching, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany
Filed Sep. 13, 1984, Ser. No. 650,403
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333686
Int. Cl.[4] H01J *37/065*
U.S. Cl. 219—121 ET 12 Claims



1. An electron gun comprising:
a beam generator with a cathode and beam-forming electrode;
a high-voltage connection and a high-voltage insulator to which said beam generator is attached;
at least one insulating transformer and circuit means for producing auxiliary voltages at high-voltage potential;
a grounded conductive jacket surrounding said beam generator and said high-voltage insulator, said insulating transformer being disposed above said high-voltage insulator;
insulating means mounted directly on said high-voltage insulator, said at least one insulating transformer being

embedded in said insulating means, a portion of said insulating means overlapping said grounded jacket; and

a conductive hood which surrounds said portion of said insulating means and which encloses said at least one insulating transformer and together with said jacket forms a Faraday cage, and said circuit means for the auxiliary voltages also being disposed in said Faraday cage.

4,574,179

ION BEAM MACHINING DEVICE

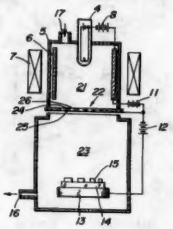
Takshisa Masuzawa, Kamakura, and Ichiro Tsuchiya, Tokyo, both of Japan, assignors to University of Tokyo, Tokyo, Japan

Filed Feb. 29, 1984, Ser. No. 584,962

Claims priority, application Japan, Jul. 14, 1983, 58-126848

Int. Cl.[4] H05H *5/02*; B23K *9/00*

U.S. Cl. 219—121 PG **4 Claims**



1. An ion beam machining device, comprising: a plasma-generating chamber for producing plasma ions, an ion-extracting grid for extracting the produced ions as ion beams, a machining chamber for irradiating the extracted ion beams onto a workpiece, said ion-extracting grid having an electrical insulator layer facing the plasma-generating chamber and an electrical conductor layer, and a plurality of holes extending through both said insulator layer and said conductor layer, and means for connecting said conductor layer to a workpiece through a suppressor power source to generate an electric potential which is negative relative to potential of said plasma, wherein said insulator layer of said grid is thicker than said conductive layer thereof to focus said ion beam for machining.

4,574,180

BEAM ALIGNMENT SYSTEM FOR LASER WELDING SYSTEM

William H. Kasner, Penn Hills; Richard A. Miller, N. Huntingdon, and Vincent A. Toth, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,296

Int. Cl.[4] B23K *26/02*

U.S. Cl. 219—121 LY **17 Claims**

1. Apparatus for performing a plurality of laser machining operations, said laser machining apparatus comprising:

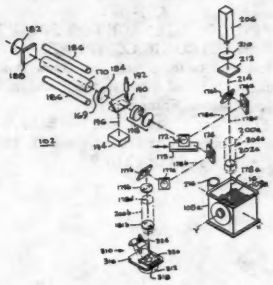
(a) means for emitting a laser beam along a path;

(b) means disposed within said path and movable along an axis for variably focusing the laser beam at a plurality of different focal spots corresponding to said plurality of laser machining operations;

(c) means for aligning at least a portion of said path with said axis, whereby the lateral displacement of each of said plurality of focal spots from said axis is reduced as said focusing means is moved along said axis;

(d) an alignment target; and

(e) means for removably mounting said alignment target within said path, whereby said alignment target intercepts



the laser beam and casts a shadow whose pattern is indicative of whether or not said path is aligned with said axis.

4,574,181

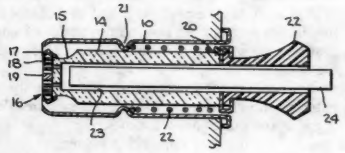
AROMA-GENERATING AUTOMOBILE CIGARETTE LIGHTER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 9, 1984, Ser. No. 658,778

Int. Cl.[4] F22B *1/28*; F23Q *7/00*

U.S. Cl. 219—274 **7 Claims**



1. An automobile cigarette lighter adapted to generate an aromatic vapor, the lighter being releasably retained within a dashboard socket provided with terminals connected to a battery of the vehicle, said lighter comprising:

A. a cylindrical shell;

B. a spring-biased plunger telescopically received in the shell;

C. a disc-shaped heater attached to a front end of the plunger and having contacts which in an inactive position of the lighter are spaced from the terminals;

D. a knob attached to a rear end of the plunger and projecting beyond the shell, whereby when the knob is pressed in, the plunger is advanced to an activated position in which the contacts of the heater engage the terminals in the socket to effect energization of the heater;

E. a latching element to retain the plunger in its activated state and to release the plunger when the heater temperature reaches a predetermined level, said plunger and said knob having a central duct therein extending longitudinally from a point adjacent the heater to an opening in the knob; and

F. a replaceable tubular fragrance cartridge inserted in the duct and having an open-ended heat-responsive aroma-producing element therein which is activated by the heat to exude an aromatic vapor into the vehicle interior, said cartridge having a length relative to that of said duct whereby a front end of the inserted cartridge lies adjacent said heater in heat exchange relationship therewith, and a rear end thereof extends beyond the opening in the knob whereby the cartridge may readily be removed from the

duct, the aroma being discharged from the open rear end of the cartridge.

4,574,182

CONTINUOUS FURNACE FOR SOLDERING ELECTRONIC COMPONENTS

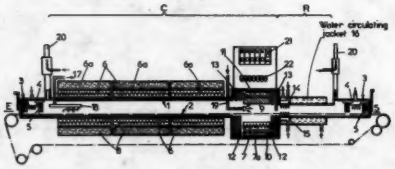
Richard Pescatore, Antibes, and Jean-Jack Boumendil, Villeneuve-Loubet, both of France, assignors to Piezo-Ceram Electronique, Antibes, France

Filed Nov. 17, 1983, Ser. No. 552,975

Claims priority, application France, Nov. 17, 1982, 82 19220

Int. Cl.[4] F27B *9/06*

U.S. Cl. 219—388 **2 Claims**



1. A continuous furnace for soldering an assembly of electronic components mounted on a substrate which is opaque to infrared rays by means of a soldering product having an eutectic melting temperature, comprising in combination:

a metallic muffle defining a furnace chamber through which said assembly to be soldered is to travel, said muffle being adapted to contain said assembly in a controlled atmosphere and having an inlet and an outlet for entry and exit of said assembly, respectively, and said chamber comprising, in order, from the inlet to the outlet of said muffle, a first heating section, a second heating section and a cooling section;

conveying means for transporting said assembly, said means entering the chamber at the inlet of said muffle and leaving it at the outlet of said muffle;

means for driving said conveying means;

first heating means, external to said muffle, for heating said first heating section and ensuring a temperature rise of said assembly up to a temperature plateau below the eutectic melting temperature of the soldering product;

second heating means, internal to said muffle, for heating, in said second heating section, the soldering product to a temperature above said eutectic melting temperature while heating said electronic components to a lower temperature, said second heating means including infrared-ray-emitting heating means located beneath said conveying means and a reflector provided, in said second heating section, above and facing said conveying means;

means for thermally insulating said first and second heating sections;

forced cooling means for cooling said cooling section;

means for introducing at least one gas into said chamber; and

isolation means provided at the inlet and outlet of said muffle for isolating the chamber.

4,574,183

ELECTRICALLY HEATED DEEP FRYER

Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

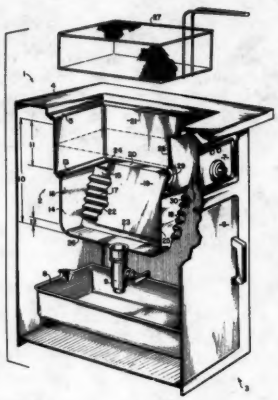
Filed Aug. 14, 1984, Ser. No. 640,564

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329793

Int. Cl.[4] F27D *11/00*

U.S. Cl. 219—438 **17 Claims**

1. An electrically heated deep fat fryer comprising: a main container having walls defining a frying fat area, said walls being made of material to be heated and the walls being adapted to hold frying fat, an upper zone of said main container forming a frying area for receiving a food-holding insert, said main container below the frying area and directly adjacent thereto forming a frying fat flow circulation well having a smaller width than the frying area, at least one wall of the main container on an outside of the well having groove-like depressions, electric tubular heating elements being inserted in the



depressions over substantially an entire height of the well, the heating elements being attached to the wall in thermally conductive connection and inside the well an insert wall being positioned so as to form a rising flow channel with said wall and a falling flow channel on an opposite side of the insert wall, said insert wall forming a common wall of the rising and falling channels.

4,574,184

SAUCEPAN AND COVER FOR A COOKING UTENSIL, PARTICULARY A STEAM PRESSURE COOKING PAN

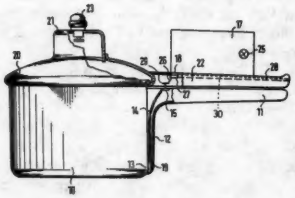
Kurt Wolf, Wildbad, and Wolfram K. Andre, Aichwald, both of Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 539,482, Oct. 6, 1983, Pat. No. 4,535,229. This application May 9, 1985, Ser. No. 732,140

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238768

Int. Cl.[4] F27D *11/00*

U.S. Cl. 219—440 **11 Claims**



1. A cooking vessel comprising a saucepan of heat conductive material and a cover, particularly a steam pressure cooker, to which heat is applied from an external heat source underneath said saucepan and to which a temperature-dependent resistor is attached as a temperature sensor and connected to a computing device for determination of the temperature in said saucepan and for transmission of electrical signals correspond-

ing to the temperature measured, characterized by a measuring point (13) being located on the external surface of said saucepan (10) in the transition region between the pan wall and the pan bottom, said temperature sensor (19) being mounted to said pan (10) at said measuring point (13) in a heat-conducting fashion; said measuring point (13) and said temperature sensor (19) being covered by an attachment portion (12) of a handle (11) which is mounted detachably on said pan (10); said handle (11) mounted on said pan (10), facing a handle (22) mounted on said cover (20), said handle (11) provided on an upper surface with a connection contact (15) and said handle (11) aligned with said handle (22) when said cover (22) is positioned on said saucepan (10), said connection contact (15) in electrical connection with a counter-contact (29) provided on a lower surface of said handle (22) mounted on said cover (20); said handle (22) having a plug receptacle (28) to receive said computing device formed as separate plug unit (17) in which a connection contact (27) is provided to match a counter-contact (18) provided on said plug unit (17); said counter-contact (29) and said connection contact (27) in said handle (22) are in electrical contact with each other; and said plug unit (17) is mechanically insertable in said plug receptacle (28), whereby said counter-contact (18) provided on said plug unit (17) is in electrical contact with said connection contact (27) provided in said plug receptacle (28).

4,574,185

TEMPERATURE CONTROL CIRCUITRY FOR A COOKING APPARATUS

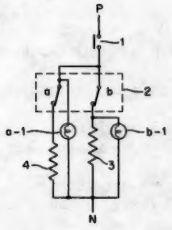
Frédy Wenger, Chemin de l'Ormet 17A, 1024 Ecublens, Switzerland

Filed Nov. 14, 1984, Ser. No. 671,552

Claims priority, application Switzerland, Nov. 16, 1983, 6148/83

Int. Cl.⁴ H05B *10/02*

U.S. Cl. 219—494 **5 Claims**



1. In a cooking apparatus having a liquid cooking medium, circuitry comprising a first electrically controlled indicator operable to sensibly indicate when a preselected temperature obtains in the liquid cooking medium, a second electrically controlled indicator operable to sensibly indicate when a given temperature below said preselected temperature obtains in the liquid cooking medium, a thermostatic device operable automatically in dependence upon temperatures of the liquid cooking medium having a normally initially closed first switch operable automatically to an open position in dependence upon temperatures detected in the liquid cooking medium connected to open automatically and cause the first indicator to sensibly indicate when the preselected temperature obtains and operable automatically to a closed position when the temperature is below said preselected temperature, and a second switch operable automatically to closed and open positions in dependence upon temperatures detected in the liquid cooking medium and connected to operate automatically to a position to cause the second indicator to sensibly indicate that the given temperature below said preselected temperature obtains, means for heating automatically controlling the application of heat to the liquid cooking medium connected to be controlled electrically by said normally initially closed first switch for effectively applying of heat to the liquid cooking medium, and electrical connections under control of the first switch for automatically disconnecting the last-mentioned means when the temperature of said liquid cooking medium is above the preselected temperature and for connecting said last-mentioned means when the temperature of the liquid cooking medium is below said preselected temperature.

4,574,186

HEATING SHEET

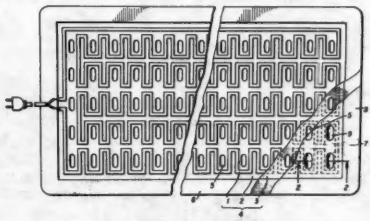
Yoshio Sakai, Ueda, and Takeshi Yamada, Saku, both of Japan, assignors to Totoku Electric Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,492

Claims priority, application Japan, Apr. 6, 1982, 57-49566[U]

Int. Cl.⁴ H05B *3/36*

U.S. Cl. 219—528 **2 Claims**



1. A heating sheet comprising a heater element which is obtained by forming a metal foil heating circuit on one surface of a first plastic sheet and superposing a second plastic sheet of the same shape as said first plastic sheet thereover, and adhering said first and second plastic sheets together; through holes formed in a regular pattern in portions of said heater element other than portions having said metal foil heating circuit formed therein; and a pair of protective thermoplastic covers which clamp said heater element therebetween and which are bonded together at a periphery of said heating sheet and through said through holes; wherein those portions of said protective covers which correspond to said through holes are recessed and indented due to said through holes in said heater element, thereby distinguishing the locations of said through holes.

4,574,187

SELF REGULATING PTCR HEATER

James E. Crews, North Adams, and George H. Rodriguez, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

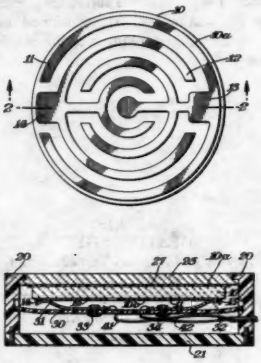
Filed Aug. 29, 1980, Ser. No. 182,548

Int. Cl.⁴ H05B *3/10*

U.S. Cl. 219—541 **8 Claims**

1. A self regulating PTCR heater comprising a ceramic PTCR plate, a pair of interdigitated film electrodes being bonded to one major surface of said plate, and an electrodes terminations means at said one major surface for electrically

connecting said electrodes to an electrical energy source, the opposite major surface of said plate being entirely metal free to



enable efficient heat transfer therefrom to an abutting object to be heated.

4,574,188

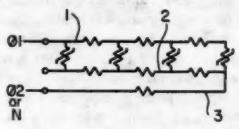
ELONGATE ELECTRICAL ASSEMBLIES

John A. Midgley, San Carlos, and Richard H. Hulett, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 369,309, Apr. 16, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 745,367

Int. Cl.[4] H05B *3/54*

U.S. Cl. 219—549 **33 Claims**



1. An electrical circuit which comprises

(1) an elongate self-regulating heater which is at least 330 feet in length and which comprises

(a) a first elongate electrical connection means having a near end and a far end;

(b) a second elongate electrical connection means having a near end and a far end; and

(c) a plurality of electrical heating elements, each of said heating elements having a thermal output which decreases with temperature, whereby the heater is self-regulating, said heating elements being connected in parallel with each other between the first and second electrical connection means; and

(2) a third elongate electrical connection means which has a near end and a far end, the far end being electrically connected to said second connection means at its far end and the remainder of the third connection means being insulated from the heater; and

(3) a source of electrical power which is physically located near the near ends of the connection means and which is connected to the near end of the first connection means and to the near end of the third connection means;

whereby current inrush is reduced and power is distributed more evenly along the length of the heater.

4,574,189

TAXIMETER ASSEMBLY

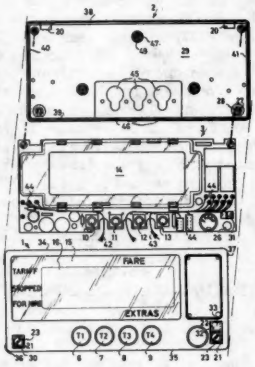
Jürgen Adams, and Hans-Peter Scholl, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,343

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419773

Int. Cl.[4] G07B *13/00*

U.S. Cl. 235—30 R **11 Claims**



1. In a taximeter assembly including electronic calculating means having data storage capacity, an operating keyboard and data indicating means for displaying actual operating data and stored data upon request, the improvement comprising:

housing means consisting essentially of a front and a rear flat housing panel;

detent means interlocking said front and rear panels together;

lead-sealed screw connection means securing said front and rear panels together;

electronic taximeter circuit means mounted on a single printed circuit board installed between said front and rear housing panels;

actuating elements and an exchangeable face plate having operating indicia thereon mounted on said front housing panel;

said rear housing panel being arranged to serve as a carrier element receiving said electronic taximeter circuit means and being equipped with means for feeding cable connections there through, said rear housing panel simultaneously operating as the mounting plate for said assembly for fastening said assembly in a vehicle.

4,574,190

VERIFYING SYSTEM

Hiroyuki Nishimura, Kameoka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 450,736, Dec. 17, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 675,269

Claims priority, application Japan, Dec. 21, 1981, 56-205082; Jan. 8, 1982, 57-1439[U]

Int. Cl.[4] G06K *7/08*

U.S. Cl. 235—449 **2 Claims**

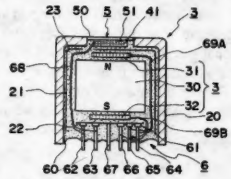
1. A system for the verification of a magnetic printed material as to whether it is genuine or counterfeit, comprising

magnetic and photo sensors arranged on the same scan line relative to the magnetically printed material for reading magnetic and optical patterns on the same scan line;

a first discriminating means for, after the magnetic and optical patterns are superimposed one above the other at the

same check point, discriminating the change in level thereof; and

a second discriminating means for discriminating change in the level of the magnetic pattern,



wherein the verification is performed on the basis of the results of the discrimination performed by the first and second discriminating means.

4,574,191

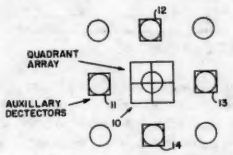
WIDE FIELD-OF-VIEW LASER SPOT TRACKER

Raymond W. Conrad, Russellville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 30, 1982, Ser. No. 454,807

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **7 Claims**



1. A system for optically tracking radiation emissions from a distant target comprising focusing means for receiving and focusing said radiation emissions onto a focal plane; a phase diffraction device placed in space relationship to the focusing means so as to cause an array of spots to appear on the focal plane; each spot being of a predetermined size and each spot being of a predetermined distance from adjacent spots; a plurality of radiation detectors located on the focal plane and spaced from each other in the same manner as the spacing of said spots; and tracking means connected to said radiation detectors, phase diffraction device and focusing means so as to cause said system to track said target.

4,574,192

FLEXIBLE FIBER OPTIC TYING MEMBER FOR THEFTPROOF DEVICE

Tadao Kitagawa, Kamifukuoka; Yutaka Kosuge, Sayama; Yoichiro Noda, Miyazaki, and Tomosaburo Sato, Kawagoe, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo; Kabushiki Kaisha Honda Rokku, Miyazaki and Kokoku Control Cable Kabushiki Kaisha, Saitama, all of, Japan

Division of Ser. No. 438,341, Nov. 1, 1982. This application Sep. 19, 1984, Ser. No. 652,216

Claims priority, application Japan, Nov. 16, 1981, 56-183389; Nov. 16, 1981, 56-183390

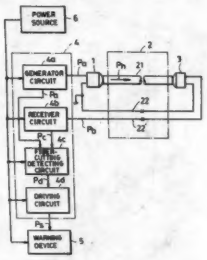
Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **3 Claims**

1. An elongate flexible tying member having an optical fiber longitudinally extending through said flexible tying member and a pair of optoelectric elements arranged at opposite ends of said optical fiber, one of said optoelectric elements being a light source and the other of said optoelectric elements being a light receptor, for use in a theftproof device including means responsive to a change in an electrical signal generated by one of said optoelectric elements, which corresponds to a change in a photo signal generated by the other of said optoelectric elements and transmitted in said optical fiber, for performing a warning function, said flexible tying member further comprising:

a flexible hollow tubular member having a hollow interior extending axially thereof;

a first layer including said optical fiber and at least one electric wire, said optical fiber and electric wire of said first layer being arranged substantially parallel with each



other and longitudinally extending through the hollow interior of said flexible hollow tubular member, said electric wire being electrically connected to at least one of said optoelectric elements; and

a second layer including a reinforcing member, said reinforcing member of said second layer longitudinally extending through the hollow interior of said flexible hollow tubular member in parallel with said optical fiber and electric wire of said first layer, said reinforcing member of said second layer comprising a plurality of strands, each formed of a plurality of twisted steel wires.

4,574,193

METHOD FOR LOGGING FLUID FLOW RATE, WATER FRACTION, AND/OR SALINITY OF WATER FLOWING INTO A WELL

Dan M. Arnold, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 26, 1984, Ser. No. 686,564

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—270 **20 Claims**

1. A method for logging salinity of water in fluids flowing into a portion of a borehole, comprising the steps of:

moving a logging sonde along a longitudinal axis of the portion of the borehole at a first relative velocity between the sonde and the fluids in the borehole while

irradiating fluids in the portion of the borehole with neutrons from a neutron source carried by the sonde, said neutrons being sufficiently energetic to induce activation of oxygen, sodium and chlorine in said fluids;

detecting gamma rays induced by said activation with at least one detector carried by the sonde at a location longitudinally displaced from the neutron source; and

generating a first count rate signal responsive to gamma rays detected at said first velocity;

moving the logging sonde along the same portion of the borehole at a second relative velocity between the sonde and the fluids in the borehole while

irradiating fluids in the portion of the borehole with neutrons from said neutron source;

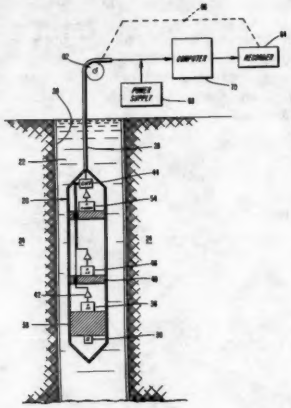
detecting gamma rays induced by activation with said detector; and

generating a second count rate signal responsive to gamma rays detected at said second velocity;

producing first and second relative velocity signals related in

value to said first and second relative velocities, respectively;

producing a logging signal related in value to the salinity of



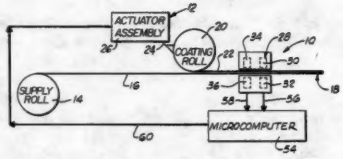
water in the fluids produced from the portion of the borehole responsive to said first and second count rate signals and said first and second relative velocity signals; and recording said logging signal.

4,574,194

METHOD AND APPARATUS FOR MONITORING THE MANUFACTURE OF A TWO-COMPONENT WEB

Montgomery R. Coats, Edmond, and Dawn E. Holt, Oklahoma City, both of Okla., assignors to Fife Corporation, Oklahoma City, Okla.

Filed Nov. 1, 1983, Ser. No. 547,628
Int. Cl.[4] G01N *23/16*
U.S. Cl. 250—308 **38 Claims**



1. An apparatus for generating signals indicative of the specific weight of both components of a layered, two-component web, comprising:

a first radiation sensor for providing a first detector signal indicative of the total specific weight of the web, the first radiation sensor comprising a first radiation detector and means for directing a first radiation beam through the finished web to the first radiation detector so that the first detector signal provides a measure of the attenuation of the first radiation beam by the web;

a second radiation sensor for providing a second detector signal indicative of an effective, one-component specific weight of the web, the second radiation sensor comprising a second radiation detector and means for directing a second radiation beam through the finished web to the second radiation detector so that the second detector signal provides a measure of the attenuation of the second radiation beam by the web; and

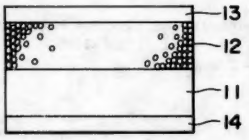
computer means, connected to the radiation sensors, for generating said signals indicative of the specific weights of the web components in response to reception of said detector signals by the computer means; wherein the first radiation beam is characterized in that the attenuation of the first radiation beam in the web is substantially independent of the relative specific weights of the two components of the web; and wherein the second radiation beam is characterized in that the intensity of the second radiation beam decays exponentially in both components of the web with the attenuation coefficient of the second radiation beam for one component of the web differing from the attenuation coefficient of the second radiation beam for the other component of the web.

4,574,195

RADIATION IMAGE STORAGE PANEL

Masanori Teraoka, and Terumi Matsuda, both of Kaisei, Japan, assignors to Fuji Photo Film Company, Ltd., Kanagawa, Japan

Filed Mar. 16, 1984, Ser. No. 590,487
Claims priority, application Japan, Mar. 17, 1983, 58-45685
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **7 Claims**



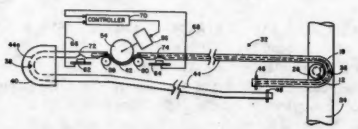
1. A radiation image storage panel comprising a support, a phosphor layer provided on the support which comprises a binder and a stimulable phosphor dispersed therein, and a protective film provided on the phosphor layer, characterized in that said support has a surface hardness lower than that of said protective film.

4,574,196

COIL SPRING CONVEYOR FOR POSITIONING AN EXTERNAL RADIOACTIVE STANDARD IN A LIQUID SCINTILLATION COUNTER

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 560,313, Dec. 12, 1983, abandoned, which is a continuation of Ser. No. 331,482, Dec. 15, 1981, abandoned. This application Dec. 10, 1984, Ser. No. 679,617
Int. Cl.[4] G01N *23/00*; G01T *1/20*
U.S. Cl. 250—328 **15 Claims**



1. In a liquid scintillation counter having a counting chamber for receiving a liquid sample containing a liquid scintillator and a sample of a radioactive substance to be counted, improved apparatus for positioning a radioactive source in an operating location to irradiate the liquid sample in the counting chamber comprising the combination of:

(1) a flexible conveyor including an elongate, generally tubular coil spring section having an interior tubular bore configured to receive the radioactive source;

(2) means for retaining the radioactive source in a predetermined axial position within the coil spring;

(3) means supporting the coil spring for movement along a

conveyor path between a storage location for the radioactive source remote from the counting chamber and an operating location for the radioactive source proximate the counting chamber; and

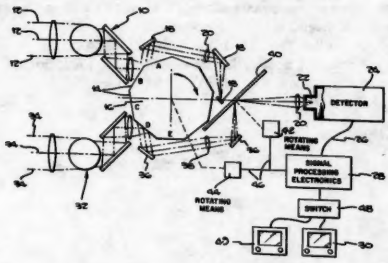
(4) drive means coupled to the coil spring and operative to drive the coil spring along the conveyor path for conveying the radioactive source between the storage and operating locations.

4,574,197

DUAL FIELD OF VIEW SENSOR

Waldo W. Kliever, Playa del Rey, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Mar. 24, 1983, Ser. No. 478,438
Int. Cl.[4] H01J *31/50;* H04N *3/08*
U.S. Cl. 250—334 19 Claims



1. A dual path optical sensor system comprising:

(a) detector means having an input and an output for receiving a light signal at said input and for converting the light signal into an electrical signal for transmission thereof from said output;

(b) a rotatable polygon scanner having a plurality of substantially equal reflective facets thereon;

(c) means for rotating said scanner at a constant speed;

(d) first optical means for receiving a first light beam and for directing the first light beam on said facets;

(e) second optical means for receiving the first light beam as it is reflected from said facets and for directing the first light beam onto said input of said detector means;

(f) third optical means for receiving a second light beam and for directing the second light beam onto said facets, said first and third optical means being mutually positioned so that, when the first light beam is impinging directly on one of said facets, the second light beam is impinging on the mid-point between two adjacent other ones of said facets, and vice-versa;

(g) fourth optical means for receiving the second light beam as it is reflected from said facets and for directing the second light beam onto said input of said detector means;

(h) means for preventing simultaneous receipt of the first and second light beams on said detector means input; and

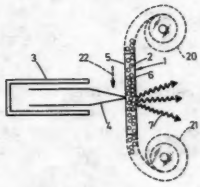
(i) means connected to said output of said detector means for receiving and processing signals resulting from the first and second light beams.

4,574,198

METHOD AND DEVICE FOR PRODUCING PHOTONS IN THE ULTRAVIOLET-WAVELENGTH RANGE

Amand A. Lucas, Croix Andre 3, 4150 Nandrin, Belgium; Jack C. Rife, Suite 209 - 2710 Macomb St., NW., Washington, D.C. 20008, and Stephen E. Donnelly, 7 Canberra Grove, Brighton East, Victoria 3187, Australia

PCT No. PCT/BE83/00010, § 371 Date Jan. 9, 1984, § 102(e) Date Jan. 9, 1984, PCT Pub. No. WO83/04099, PCT Pub. Date Nov. 24, 1983
PCT Filed May 5, 1983, Ser. No. 576,386
Claims priority, application Luxembourg, May 7, 1982, 84136
Int. Cl.[4] G21G *4/00*
U.S. Cl. 250—493.1 23 Claims



1. Method for producing photons in the UV-wavelength range, comprising the steps of:

planting in a solid matrix, ions from a gas which is inert or insoluble relative to the matrix by performing an ionic bombardment of one surface from the solid matrix with low-energy ions from at least one said gas in such a way as to obtain a low-depth planting of the gas ions in the solid matrix;

and thereafter excitating the captive gas in the solid matrix by electronic low-energy bombardment of the solid matrix; and

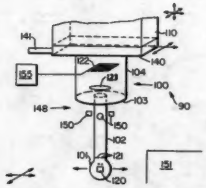
radiating and emitting said photons from the solid matrix due to the excitated gas.

4,574,199

SENSING LOCATION OF AN OBJECT

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Jan. 27, 1983, Ser. No. 461,685
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561 38 Claims



1. An apparatus for sensing the presence or location of an object in a plane perpendicular to a reference axis comprising:

optical detector means for optically detecting by use of optical triangulation techniques the presence or approximate location of the object in the plane perpendicular to the reference axis;

contact detector means for contacting the object in the plane perpendicular to the reference axis and for determining the precise location of the object; and

moving means for moving said optical detector means and said contact detector means relative to the object along the reference axis.

4,574,200

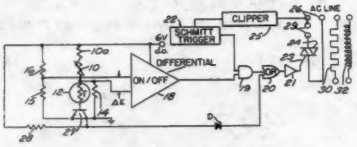
THERMISTOR TEMPERATURE CONTROL CIRCUIT

William H. Racca, Two Primrose Dr., Riverside, R.I. 02915; Michael A. Bolvin, 432 Country View Dr., Warwick, R.I. 02886, and Mel E. Bilezerian, N. Smithfield, R.I., assignors to William H. Racca and Michael A. Bolvin

Filed Jan. 18, 1984, Ser. No. 571,746

Int. Cl.[4] H01H *35/00*

U.S. Cl. 307—117 **3 Claims**



1. Method of constructing a temperature responsive Wheatstone bridge having branches using a thermistor that will control a circuit over a temperature range having a maximum temperature and a lower temperature, wherein said maximum temperature and said lower temperature having a temperature ratio of greater than 4:1 comprising the steps of:

a. selecting a thermistor which will have a resistance at the maximum temperature of the range of approximately 1k ohms,

b. placing the thermistor in a branch of said bridge and selecting a resistance to parallel the thermistor and reduce the impedance of said thermistor branch at the lower temperature end of the range,

c. selecting a variable resistance in a branch in series with the thermistor branch between a upper and lower value of the resistance of the thermistor in parallel with the resistance operating in said range whereby a low impedance bridge may be constructed with low noise and low leakage,

d. applying a voltage across the series connection of the variable resistance and thermistor, whereby the output of the bridge will be a voltage level to control an operational amplifier in open loop format.

4,574,201

RADIO FREQUENCY SWITCHING CIRCUIT DEVICE

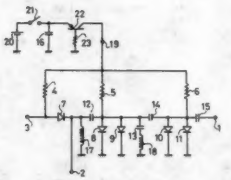
Toru Ohyama, Miyagi, and Takao Nomura, Kakuda, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 24, 1982, Ser. No. 423,115

Claims priority, application Japan, Sep. 28, 1981, 56-143611[U]

Int. Cl.[4] H03K *17/56;* **H03H** *7/00*

U.S. Cl. 307—243 **8 Claims**



1. A device for switching between two radio frequency signals, comprising:

means including first and second terminals for receiving respective radio frequency input signals;

means including a D.C. voltage terminal for receiving a D.C. voltage;

switching means controlled by the D.C. voltage to be in conductive or non-conductive states;

means including a transistor connected in series with said D.C. voltage terminal for applying said D.C. voltage to said switching means; and

a resonance circuit including a capacitor connected to said switching means and to said transistor for receiving input signals from said first and second terminals and for trapping one of the radio frequency signals by the operation of said switching means;

said resonance circuit having an effective capacitance the discharging path of which includes said transistor, such that when the switching means is in a non-conductive state and the transistor is in a substantially off state, the time constant of the discharging path is sufficiently long relative to the frequencies of said radio frequency signals to keep the capacitance charged to maintain said switching means in the non-conductive state.

4,574,202

RECTIFIER CIRCUIT WITH ATTACK TIME VARIABLE IN RESPONSE TO AN INPUT SIGNAL LEVEL

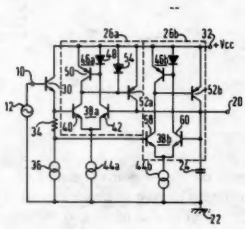
Atsushi Ogawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 15, 1982, Ser. No. 434,485

Claims priority, application Japan, Oct. 15, 1981, 56-164705

Int. Cl.[4] H03K *5/153, 5/00*

U.S. Cl. 307—261 **15 Claims**



1. A signal rectifier circuit with attack time changeable in response to an input signal level comprising:

an input terminal for receiving said input signal;

an output terminal;

capacitor means connected between said output terminal and a reference potential terminal;

first means for rectifying said input signal having an input signal current path connected between said input terminal and said output terminal for delivering said input signal, in rectified form, to said output terminal, said first rectifying means including first means for determining a first time constant together with said capacitor means;

second means for rectifying said input signal having an input signal current path connected in parallel with said input signal current path of said first rectifying means for delivering said input signal, in rectified form, to said output terminal, said second rectifying means including second means for determining a second time constant together with said capacitor means;

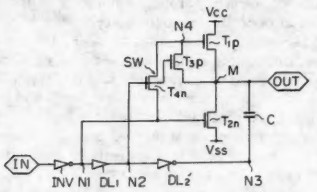
means for applying an offset voltage to one of said first and second rectifying means; and wherein

said first and second rectifying means include peak detector circuits.

4,574,203
CLOCK GENERATING CIRCUIT PROVIDING A BOOSTED CLOCK SIGNAL

Fumio Baba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 9, 1983, Ser. No. 502,570
Claims priority, application Japan, Jun. 30, 1982, 57-111532
Int. Cl.⁴ H03K *5/02*
U.S. Cl. 307—269 **10 Claims**



1. A clock generating circuit, operatively connected to first and second voltage sources, having a voltage difference therebetween, and receiving an input clock signal, said circuit comprising:

a first transistor of a first channel type, operatively connected to the first voltage source and having a gate;

a second transistor of a second channel type, operatively connected in series with said first transistor, forming a junction point therebetween, and to the second voltage source, and having a gate;

a first delay circuit, operatively connected to receive the input clock signal, for producing a delayed clock signal by delaying the input clock signal by a predetermined time delay;

a bootstrap capacitor, having a first end operatively connected to the junction point between said first and second transistors and to the output of said first delay circuit and having a second end, said bootstrap capacitor being charged to a level nearly the same as the level of said first voltage source by turning on said first transistor and turning off said second transistor, the voltage level of said bootstrap capacitor being changed by the input delayed clock signal, output by said first delay circuit, during the charging of said bootstrap capacitor, thereby producing at the second end of said bootstrap capacitor an output clock signal having first and second voltage levels with a difference therebetween which is larger than the voltage difference between the first and second voltage sources; and

a switch circuit, operatively connected to the input of said first delay circuit, the gates of said first and second transistors and the junction point, for connecting the gate of said first transistor with the junction point only for a period of time during which the voltage level of said bootstrap capacitor is changed by the delayed clock signal, and otherwise connecting the gate of said first transistor with the gate of said second transistor.

4,574,204
CIRCUIT FOR HOLDING A PULSE DURING A PREDETERMINED TIME INTERVAL AND AN IMPROVED MONOSTABLE MULTIVIBRATOR

Yves A. Bonnet, Saint Laurent Du Var, France, assignor to International Business Machines Corporation, Armonk, N.Y.

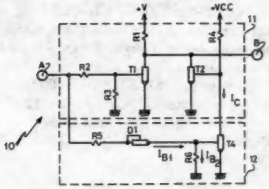
Filed Aug. 6, 1982, Ser. No. 405,804
Claims priority, application European Pat. Off., Sep. 8, 1981, 81430029.9
Int. Cl.⁴ H03K *3/284, 3/33*
U.S. Cl. 307—273 **1 Claim**

1. A monostable multivibrator for initiating an output pulse in response to the trailing edge of an input pulse, comprising:

input means connected to the base of a first transistor for receiving said input pulse;

output means connected to the collector of said first transistor and to the collector of a second transistor for providing said output pulse, the collectors of said first and second transistors being connected to a first voltage source and the emitters of said first and second transistors being grounded;

a third transistor having a collector connected to the base of



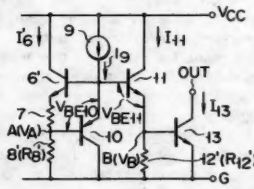
said second transistor and to said first voltage source, an emitter connected to ground, and a base connected through a diode to said input means, wherein a charge is stored in the base of said third transistor when said input pulse is applied to said input means; and

a base-emitter resistor connected between the base and the emitter of said third transistor for controllably dissipating the stored charge in said third transistor base, wherein the duration of said output pulse is determined by the value of said base-emitter resistor.

4,574,205
TEMPERATURE DETECTING TRANSISTOR CIRCUIT

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 17, 1983, Ser. No. 505,435
Claims priority, application Japan, Jun. 18, 1982, 57-103944
Int. Cl.⁴ H01L *31/00;* H03K *3/01;* H02H *5/04*
U.S. Cl. 307—310 **6 Claims**



1. A temperature detecting transistor circuit comprising:

first and second transistors of a first conductivity type, the base electrodes of which are connected to each other;

means for connecting the collectors of said first and second transistors to a first power source terminal;

first and second resistors connected in series;

means for connecting the emitter of said first transistor to a second power source terminal through said first and second resistors connected in series;

a third resistor;

means for connecting the emitter of said second transistor to said second power source terminal through said third resistor;

a current source connected between a node connecting the base electrodes of said first and second transistors and said first power source terminal;

a third transistor of a second conductivity type which is connected at the emitter to said node connecting the base electrodes of said first and second transistors, at the collector to said second power source terminal, and at the

base electrode to a node connecting said first and second resistors; and

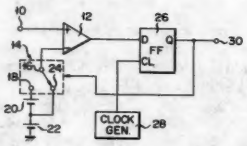
a fourth transistor which is connected at the base electrode to the emitter of said second transistor, at the emitter to said second power source terminal, and at the collector to an output terminal producing an output current responsive to temperature.

4,574,206

WAVE-SHAPING CIRCUIT

Shigeru Todokoro, Fujisawa, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 9, 1981, Ser. No. 300,604
Claims priority, application Japan, Sep. 16, 1980, 55-128334
Int. Cl.[4] H03K *5/08, 5/135*
U.S. Cl. 307—359 **6 Claims**



1. A wave-shaping circuit which comprises:

an input terminal for receipt of a coded signal;

means for generating a reference signal which reference signal varies between low and high levels in response to a control signal;

means for comparing said coded signal supplied through said input terminal with said reference signal and for producing a first type output signal when said coded input signal is less than said reference signal and for producing a second type output signal when said coded input signal is greater than said reference signal;

a clock signal generator;

means, connected to said comparing means and said clock signal generator, for holding an output signal from said comparing means for a period of time which is related to the duration of said output signal from said comparing means and in synchronism with a clock signal from said clock signal generator; and

means for branching part of an output signal from said holding means and supplying this branched output signal to said reference signal generating means as said control signal such that said reference signal generating means generates said low level reference signal when said holding means holds said first type output signal and generates said high level reference signal when said holding means holds said second type output signal from said comparing means.

4,574,207

LATERAL BIDIRECTIONAL DUAL NOTCH FET WITH NON-PLANAR MAIN ELECTRODES

James A. Benjamin, Waukesha; Herman P. Schutten, Milwaukee, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,471
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—577 **20 Claims**

1. A bidirectional FET, comprising in a semiconductor substrate:

a first source region of one conductivity type semiconductor material;

a first region of opposite conductivity type semiconductor material including a first channel region portion and forming a junction with said first source region;

a single drift region of one conductivity type semiconductor material forming another junction with said first region of opposite conductivity type;

a second region of opposite conductivity type semiconductor material including a second channel region portion and forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second region of opposite conductivity type;

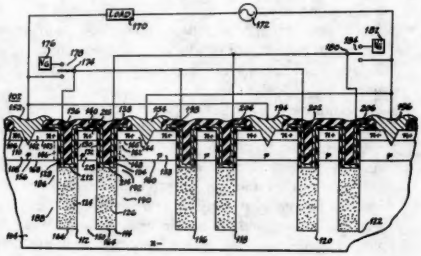
first and second spaced notches extending between said first and second source regions and said first and second channel regions, and extending into said drift region;

first insulated gate means in said first notch and including a portion proximate said first channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first channel region;

second insulated gate means in said second notch and including a portion proximate said second channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said second channel region;

first main electrode means extending into and through said first source region and into at least said first region of opposite conductivity type;

second main electrode means extending into and through said second source region and into at least said second region of opposite conductivity type;



short the otherwise blocking reverse biased said second PN junction during said first half cycle of said alternating voltage such that current flows through said FET from said first main electrode means to said second main electrode means during said first half cycle of said alternating voltage;

said FET having an OFF state in the absence of said gating electrical potential from said first and second gating voltage sources, said single drift region supporting OFF state blocking voltage in both directions, and wherein said first and second gate means are at non-common potentials in said OFF state.

4,574,208

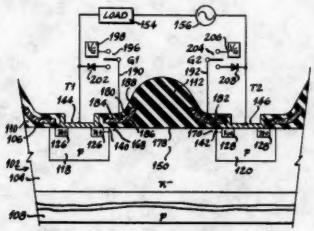
RAISED SPLIT GATE EFET AND CIRCUITRY

Robert W. Lade, Fort Myers, Fla.; Herman P. Schutten, Milwaukee, and James A. Benjamin, Waukesha, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,483

Int. Cl.[4] H03K *17/687*

U.S. Cl. 307—577 **7 Claims**



1. A bidirectional FET, comprising in a semiconductor substrate:

a first source region of one conductively type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of said one conductivity type semiconductor material forming another junction with said first channel region;

a second region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region; and

raise gate electrode means disposed proximate said first and second channel regions and including at least a portion spaced a greater distance from said drift region, said rasied gate electrode means adapted for application of an electrical potential for producing an electric field of sufficient intensity to invert the conductivity type in at least a portion of said first and second channel regions, said raised gate electrode means comprising split gate electrodes comprising a first gate electrode spaced above said first channel region and extending upwardly and laterally over said drift region, and a second gate electrode spaced above said second channel region and extending upwardly and laterally over said drift region and laterally spaced apart from said first gate electrode;

said single drift region forming first and second PN junctions with respective said first and second channel regions, said first and second source regions forming third and fourth PN junctions with respective said first and second channel regions;

a first main electrode contacting said first source region and said first channel region;

a second main electrode contacting said second source region and said second channel region;

a source of alternating voltage impressed across said first and second main electrodes such that during the first half cycle of said alternating voltage said first PN junction is a forward biased junction and said second PN junction is a reverse biased junction, and such that during the second half cycle of said alternating voltage said second PN junction is a forward biased junction and said first PN junction is a reverse biased junction;

a first gating voltage source connected to said first gate electrode in said second half cycle of said alternating voltage to create a first inversion channel region between said single region and said first source region to short the otherwise blocking reverse biased said first PN junction during said second half cycle of said alternating voltage such that current flows through said FET from said second main electrode to said first main electrode during said second half cycle of said alternating voltage;

a second gating voltage source connected to said second gate electrode in said first half cycle of said alternating voltage to create a second inversion channel region between said single drift region and said second source region to short the otherwise blocking reverse biased said second PN junction during said first half cycle of said alternating voltage such that current flows through said FET from said first main electrode to said second main electrode during said first half cycle of said alternating voltage;

said FET having on OFF state in the absence of said gating electrical potential from said first and second gating voltage sources, said single drift region supporting OFF state blocking voltage in both directions, and wherein said first and second gate electrodes are at non-common potentials in said OFF state.

4,574,209

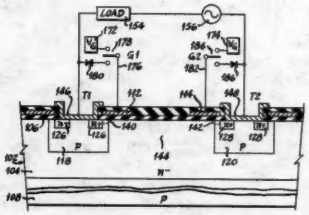
SPLIT GATE EFET AND CIRCUITRY

Robert W. Lade, Fort Myers, Fla.; Herman P. Schutten, Milwaukee, and James A. Benjamin, Waukesha, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,562

Int. Cl.[4] H03K *17/687*

U.S. Cl. 307—577 **6 Claims**



1. A bidirectional FET, comprising in a semiconductor substrate:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of said one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semi-

conductor material forming a junction with said second channel region; and

split gate electrode means comprising a first gate electrode disposed proximate said first channel region and a second gate electrode disposed proximate said second channel region, and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in at least a portion of said first and second channel regions;

said single drift region forming first and second PN junctions with respective said first and second channel regions, said first and second source regions forming third and fourth PN junctions with respective said first and second channel regions;

a first main electrode contacting said first source region and said first channel region;

a second main electrode contacting said second source region and said second channel region;

a source of alternating voltage impressed across said first and second main electrodes such that during the first half cycle of said alternating voltage said first PN junction is a forward biased junction and said second PN junction is a reverse biased junction, and such that during the second half cycle of said alternating voltage said second PN junction is a forward biased junction and said first PN junction is a reverse biased junction;

a first gating voltage source connected to said first gate electrode in said second half cycle of said alternating voltage to create a first inversion channel region between said single drift and said first source region to short the otherwise blocking reverse biased said first PN junction during said second half cycle of said alternating voltage such that current flows through said FET from said second main electrode to said first main electrode during said second half cycle of said alternating voltage;

a second gating voltage source connected to said second gate electrode in said first half cycle of said alternating voltage to create a second inversion channel region between said single drift region and said second source region to short the otherwise blocking reverse biased said second PN junction during said first half cycle of said alternating voltage such that current flows through said FET from said first main electrode to said second main electrode during said first half cycle of said alternating voltage;

said FET having an OFF state in the absence of said gating electrical potential from said first and second gating voltage sources, said single drift region supporting OFF state blocking voltage in both directions, and wherein said first and second gate electrodes are at non-common potentials in said OFF state.

4,574,210

EXTERNAL ROTOR MOTOR HAVING A COOLING SYSTEM

Heinz Wieland, Waldenburg, Fed. Rep. of Germany, assignor to Wilhelm Gebhardt GmbH, Waldenburg, Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,396
Int. Cl.⁴ H02K *9/00*
U.S. Cl. 310—59 **8 Claims**

1. An external rotor motor having an external rotor and an inner fixed stator, said motor characterized by:

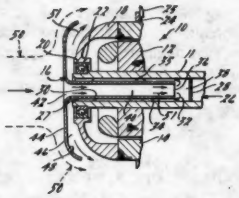
a shaft having an axially extending hollow interior with said stator fixed on said shaft;

said rotor rotatably supported on the shaft;

a deflecting plate axially spaced away from said rotor and stator and radially extending outward from a central longitudinal axis of said shaft to form a channel between said plate and said rotor;

said shaft having a passage formed within the axially extending hollow interior to receive a heat transporting medium and to pass said heat transporting medium to said channel and radially outward through said channel to form a first flow of said heat transporting medium;

means for generating a second flow of said heat transporting



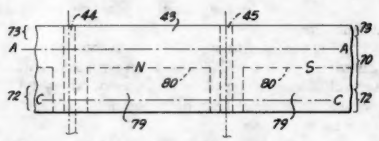
medium on an opposite side of said deflecting plate with respect to said channel and radially beyond said deflecting plate such that a suction effect occurs at an outer periphery of said channel to produce said first flow.

4,574,211

BRUSHLESS D.C. MOTOR

Rolf Müller, St. Georgen, and Reinhold Wurdak, Furtwangen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,145
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125694
Int. Cl.⁴ H02K *11/00*
U.S. Cl. 310—68 R **24 Claims**



1. Brushless d.c. motor having a stator (**10**) and a permanent magnet rotor (**40**) facing each other across a substantially cylindrical air gap (**23**), said stator including a lamination-stack core and conductor means thereon for energization by current pulses, said rotor having a first axially extending portion (**72**) extending beyond the stator for control of at least one galvanomagnetic sensor (**30**) located outside said air gap (**23**) for control thereof by the poles of said first axially extending rotor portion, said sensor being adapted for controlling the application to said conductor means of pulses energized by d.c., the poles of said rotor being distributed in the circumferential direction on the rotor and incorporating the improvement that the magnetization of said rotor, at least in said first axially extending portion, is constituted in a pattern providing regions of relatively weaker magnetization in the respective mid portions of the magnetic poles and regions of relatively stronger magnetization adjacent to said midportions and extending towards the boundaries (**44,45**) between adjacent magnetic poles.

4,574,212
COMMUTATOR END DUST SEAL FOR AN ELECTRIC MOTOR

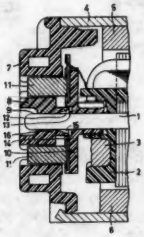
Bernardus Haijkens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 558,067, Dec. 5, 1983. This application Mar. 14, 1985, Ser. No. 712,323

Claims priority, application Netherlands, Dec. 9, 1982, 8204764

Int. Cl.⁴ H02K *5/10*

U.S. Cl. 310—88 **1 Claim**



1. An electric motor comprising a stator, a rotor having a rotor shaft, a bearing journalled around one end of the shaft, a commutator on said one shaft end, and brushes engaging said commutator,

characterized by comprising a sleeve extending axially from and formed with said bearing as a one-piece unitary element, said sleeve having an inner surface defining an open-ended frusto-conical space surrounding the shaft and tapering toward the interior of the bearing,

said commutator having an annular recess and said sleeve extending into said recess to form a dust seal.

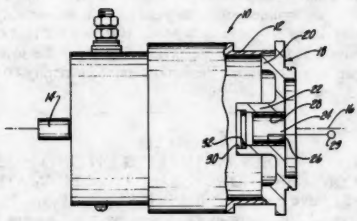
4,574,213
BEARING SUPPORT AND SEAL FOR A STARTER MOTOR HOUSING

Julius J. Stevens, Fort Deposit, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 487,264, Apr. 21, 1983. This application Nov. 26, 1984, Ser. No. 674,716

Int. Cl.⁴ H02K *5/10, 7/08*

U.S. Cl. 310—90 **7 Claims**



1. A starter motor housing having a shaft rotatably mounted therein comprising:

a tubular and cylindrical housing member, said housing member open at one end and forming an interior housing chamber,

a circular end plate having an integral elongated sleeve with an axial bore extending axially outwardly from one side of said end plate,

means for detachably securing said end plate to said open end of said housing so that said sleeve extends axially inwardly into said housing chamber, said axial sleeve bore forming a bearing surface for the shaft,

a resilient seal carried adjacent an inner end of said sleeve, said seal engaging an outer peripheral surface of the shaft, said seal being radially compressed between said sleeve and the shaft to thereby form a fluid tight seal between said sleeve and the shaft,

wherein said seal forms the only fluid seal between said shaft and said end plate so that a lubricant can flow from an outer end of said sleeve and along said bearing surface.

4,574,214
ELECTRIC ROTARY DEVICE OF PERMANENT MAGNET TYPE

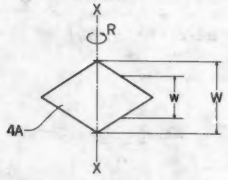
Kiyonori Fujisaki, 195-4 Ooyaguchi, Matsudo-shi, Chiba-ken, Japan

Continuation of Ser. No. 417,909, Sep. 14, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 659,858

Claims priority, application Japan, Sep. 24, 1981, 56-141837[U]

Int. Cl.⁴ H02K *21/26*

U.S. Cl. 310—154 **8 Claims**



1. An electric rotary device of permanent magnet type comprising:

a stator including a plurality of permanent magnets and a rotor mounted within the stator for rotation about a central axis, said rotor including an armature core and a plurality of windings wound around said armature core, said permanent magnets each having an axial length dimension at the center thereof along the central axis of rotation, the axial length dimension along the central axis being a maximum at the center of each permanent magnet and being progressively reduced toward both side ends of each permanent magnet.

4,574,215
BRUSHGEAR FOR MINIATURE MOTORS

Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

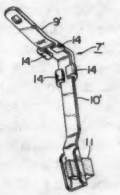
Filed Aug. 16, 1983, Ser. No. 523,429

Claims priority, application Japan, Aug. 20, 1982, 57-125733[U]

The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—239 **16 Claims**



1. Brushgear for a miniature motor comprising: brush arms each having a terminal strip, made of a flexible and electrically

conductive metal strip, forming a terminal portion adapted to extend through a motor case of the motor and adapted for external connection, and a commutator contactor strip, made of a highly resilient and electrically conductive metal strip, forming a commutator contactor portion adapted for making electrical contact with a commutator of the motor by means of a brush mounted on said commutator contactor strip; and brush supporting means provided on a case cover of the motor case for supporting said brush arm; said terminal strip having a plurality of projections formed by extending the strip; said projections being bent and crimped, with said terminal strip and said commutator contactor strip at least partly overlapping, to join said terminal and commutator contactor strip together into one piece at a joint.

4,574,216

CATHODE-RAY TUBE AND SEMICONDUCTOR DEVICE FOR USE IN SUCH A CATHODE-RAY TUBE

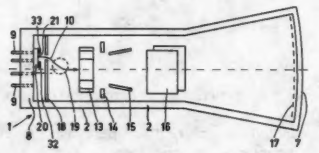
Arthur M. E. Hoeberechts, and Gerardus G. P. van Gorkom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

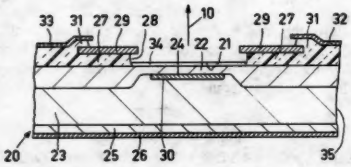
Continuation of Ser. No. 422,228, Sep. 23, 1982, abandoned. This application Mar. 19, 1985, Ser. No. 713,584

Claims priority, application Netherlands, Oct. 29, 1981, 8104893

Int. Cl.⁴ H01J *29/04*

U.S. Cl. 313—444 **13 Claims**





1. A device for recording or displaying pictures, comprising an elongated cathode-ray tube with an elongated axis and having, in an evacuated envelope, a target and a semiconductor cathode having a semiconductor body with a major surface on which a first electrically insulating material layer having at least one aperture is provided, which semiconductor body comprises at least a p-n junction in which the application of voltage in the reverse direction across the p-n junction causes electrons to be generated in the semiconductor body by avalanche multiplication, said electrons emanating from the semiconductor body at the area of the aperture in the first electrically insulating material, and in which at least an accelerating electrode is provided on the first electrically insulating material at least at the area of the edge of the aperture in said layer, wherein the improvement comprises additional electrically-insulating material covering at least part of the semiconductor body other than said aperture in the first insulating material, said additional electrically insulating material having at least two deflection electrodes on it for generating a static dipole field.

4,574,217

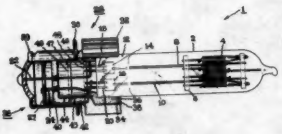
INCANDESCENT LAMP AND BASE

Edward A. Pendergrass, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1983, Ser. No. 466,284

Int. Cl.⁴ H01K *1/50*

U.S. Cl. 313—579 **3 Claims**



1. A tungsten halogen cycle lamp of the relatively high voltage type with a three-part electrically insulated ceramic base which comprises:

(a) a transparent vitreous envelope containing a multi-filament incandescent lamp coil suspended from a filament mount and connected to a pair of refractory metal inleads hermetically sealed to the vitreous envelope in a press seal region at one end of said envelope;

(b) externally extending termination conductors secured to said lamp inleads to provide electrical current to said lamp;

(c) an inert gas filling within said vitreous envelope which contains sufficient halogen to produce the halogen cycle during lamp operation;

(d) wherein the improvement comprises having all three base parts sealed together in butt-sealed engagement along a horizontal plane transverse to the longitudinal lamp axis by means of ceramic sealing material, said ceramic base comprising an upper base part having a central cavity opening in which the press seal end of said lamp is supported and a lower base part which contains a passageway for said externally extending termination conductors, said base parts being spaced apart with an intermediate base part also containing a passageway for said externally extending termination conductors;

(e) ceramic sealing material being disposed in the central cavity of said upper base part to secure the press seal end of said lamp in said cavity; and

(f) a two-part metal base shell secured to said ceramic base which serves as a means to optically focus the lamp filament, said metal base shell having an inner shell member directly bonded to the exterior surface of said ceramic base part which is inserted into an outer shell member for a predetermined distance related to the optical focus of said lamp filament, and with said externally extending termination conductors protruding from the lower base part of said ceramic base and being electrically connected to said metal base shell.

4,574,218

METAL VAPOR LAMP HAVING INTERNAL MEANS PROMOTING CONDENSATE FILM FORMATION

Robert L. Bateman, Jr., Chagrin Falls, and Thomas F. Soules, Cleveland Hts., both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,588

Int. Cl.⁴ H01J *61/35*

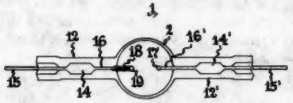
U.S. Cl. 313—635 **6 Claims**

1. A high intensity metal vapor discharge lamp comprising:

a sealed envelope having light-transmitting walls;

a filling in said envelope producing a vapor in which an electric discharge generates light; said filling including a dose of metal salt substantially in excess of the quantity vaporized in operation of said lamp; said dose being liquid at the wall temperature in said envelope during operation;

electrode means for supporting a discharge within said envelope; and



film-formation-promoting means comprising a coating of fine refractory oxide particles adherent to the interior surface of said envelope for promoting the formation and spreading of a liquid condensate film thereon.

4,574,219

LIGHTING UNIT

John M. Davenport, Lyndhurst; Richard L. Hansler; Ralph M. Potter, both of Pepper Pike; John M. Blank, Windsor; Dimitri M. Speros, Painesville; Arthur S. Homa, Cleveland Hts.; Amarendra Mishra, Lyndhurst, and Robert A. Leskovec, Richmond Hts., all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 25, 1984, Ser. No. 613,926

Int. Cl.[4] H01J *7/44*

U.S. Cl. 315—49 **16 Claims**

1. An improved electrode for use in a gas discharge tube and capable of being rendered thermionic in response to a ballast circuit,

said gas discharge tube comprising a light-transmissive envelope containing (1) an inert gas having a fill pressure of about 10 torr to about 500 torr; (2) a metal selected from the group consisting of mercury and mercury cadmium amalgam and alloys thereof; and (3) a metal halide gas selected from the group of compounds of sodium iodide and scandium iodide;

said ballast circuit comprising means for sequentially supplying to said improved thermionic electrode, (1) breakdown high voltage in the range of about 300 volts to about 2000 volts, and (2) a voltage in the range of about 0 volts to about 170 volts with limiting steady state currents in the range of about 0.3 ampere to about 0.6 ampere and transient currents of about 100 amperes and about 10 amperes; and

said improved thermionic electrode comprising a cermet material covering at least a portion of said electrode, said cermet material having a particle size in the range of about 1.0 microns to about 50 microns and comprised of a tungsten powder and a metal oxide having respective percent weight ratios in the range of 98 to 70 and 2 to 30, said metal oxide being formed from a metal selected from the group consisting of scandium, aluminum, dysprosium, thorium, yttrium and zirconium and mixtures of the selected metals.

4,574,220

COMBINATION ELECTRIC POWER BUS AND FLUORESCENT DROP LIGHT

Ernest L. Tate, 9628 San Diego St., Spring Valley, Calif. 92077

Filed Apr. 1, 1983, Ser. No. 467,890

Int. Cl.[4] H05B *37/02, 41/00;* **H02G** *11/02*

U.S. Cl. 315—57 **11 Claims**

1. An AC electric power bus for powering conventional single-phase AC devices and for alternately providing fluorescent lighting, comprising:

(a) a first and a second wire connected across a source of AC electric power,

(b) a fluorescent lamp ballast means having two terminals, a first terminal being in electrical communication with the second wire,

(c) a first coupling means having three electrical contacts, a first contact being in electrical communication with the first wire, a second contact being in electrical communication with the second wire, and a third contact being in electrical communication with a second terminal of the ballast means, the first and second contacts being adapted to outlet the AC electric power to the conventional AC devices,

(d) a second coupling means having at least two contacts and adapted to mate with the first coupling means such that when they are mated a first contact of the second coupling means is in electrical communication with the first contact of the first coupling means, and a second contact of the second coupling means is in electrical communication with the third contact of the first coupling means, and

(e) a fluorescent tube having two ionizing terminals, a first ionizing terminal being in electrical communication with the first contact of the second coupling means, and a second ionizing terminal being in electrical communication with the second contact of the second coupling means.

4,574,221

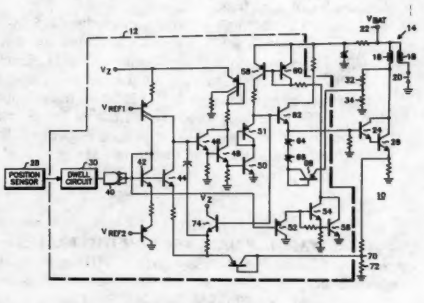
IGNITION CONTROL INTEGRATED CIRCUIT HAVING SUBSTRATE INJECTION PREVENTING MEANS

Robert M. Hess, Roselle, Ill., and Robert B. Jarrett, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1984, Ser. No. 567,973

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—209 T **19 Claims**



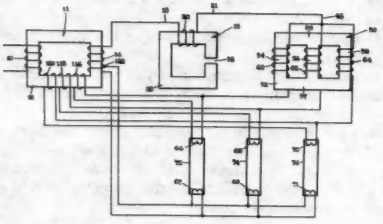
1. An integrated circuit of the type having a semiconductor substrate and adapted to facilitate the storage of energy in and the release of energy from external capacitive or inductive loads resulting in transient voltages within said integrated

circuit during the release of said stored energy and wherein said integrated circuit includes an output transistor having a base, an emitter, and a collector, signals at one of said emitter and collector used for controlling the storage and release of said energy, conduction of said output transistor being controller by a driver stage coupled to the base of said output transistor and providing drive signals thereto, the improvement comprising substrate injection preventing means for precluding the injection of current from said substrate into at least said output transistor notwithstanding said transient voltages, said substrtate injection preventing means comprising control means in said integrated circuit and separate from said driver stage for preventing current flow through said base of said output transistor during the release of said stored energy and despite said transient voltages, thereby preventing substrate injection.

4,574,222
BALLAST CIRCUIT FOR MULTIPLE PARALLEL NEGATIVE IMPEDANCE LOADS

Thomas E. Anderson, Avon, Conn., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,319
Int. Cl.⁴ H05B *41/16, 41/24*
U.S. Cl. 315—254 **12 Claims**



1. A gas discharge lamp circuit comprising:
power supply means for supplying an a.c. voltage output;
impedance means for limiting the current level of said a.c. voltage output from said power supply means;
a plurality of at least three electrical load means connected electrically in parallel for receiving electrical power from said power supply means; and
current-balancing transformer means for providing current sharing among said plurality of electrical load means comprising:
magnetic core means having a plurality of magnetic core legs equal to the number of electrical load means and magnetic core top bars and bottom bars connecting said plurality of core legs;
a plurality of electrical windings each disposed upon a respective one of said core legs and connected electrically in series with a respective one of said electrical loads; said windings being wound upon said respective core legs such that magnetic flux induced in each of said respective core legs by current flowing through said respective windings to supply said respective loads tends to flow in the same direction relative to said top and bottom bars.

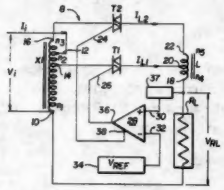
4,574,223
FAST WARMUP BALLAST FOR HID LAMPS

Ira J. Pitel, Morristown, N.J., assignor to HID Systems, Inc., Sparta, N.J.

Filed Jan. 12, 1984, Ser. No. 570,111
Int. Cl.⁴ H05B *41/14, 41/36*
U.S. Cl. 315—307 **16 Claims**

2. A fast warmup ballast for a high intensity discharge lamp comprising

a transformer having two input taps adapted for connection to an a.c. power source and two output taps,
a multitap inductor having one tap adapted for connection through a lamp to one of said input taps of said transformer and two other taps each connected through one of two selectively operable switch means to one of said two output taps of said transformer, and

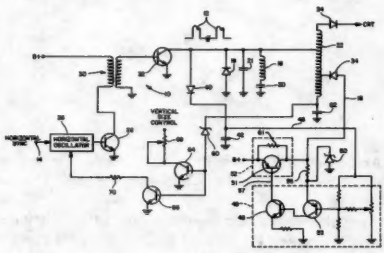


means for alternatively closing one or the other of said switch means in response to comparison of an operating characteristic of the lamp to a reference,
whereby during lamp warmup a high current is supplied to the lamp through one of said switch means, and after warmup a high voltage is supplied through the other of said switch means.

4,574,224
VARIABLE RATE HORIZONTAL DEFLECTION SYSTEM FOR A VIDEO MONITOR

Philip J. Nowaczyk, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 17, 1983, Ser. No. 524,165
Int. Cl.⁴ H01J *29/70, 29/76*
U.S. Cl. 315—408 **22 Claims**



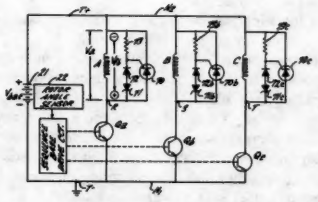
1. Apparatus for operating the CRT of a video display, comprising:
a horizontal deflection yoke;
means for generating a B+ boltage;
means for developing a variable frequency horizontal oscillator signal;
a horizontal output transistor coupled to the horizontal deflection yoke and responsive to said horizontal oscillator signal and to said B+ voltage for developing a horizontal output signal having a frequency corresponding to the frequency of said horizontal oscillator signal and a pulse amplitude which is a function of said B+ voltage and the frequency of said horizontal oscillator signal;
means coupled between the horizontal output transistor and the horizontal deflection yoke for peak detecting the pulse amplitude of said horizontal output signal; and
means responsive to said peak detected pulse amplitude for adjusting the level of said B+ voltage to maintain the pulse amplitude of said horizontal output signal constant despite variations in the frequency of the horizontal oscillator signal.

4,574,225

APPARATUS FOR ACCOMMODATING INDUCTIVE FLYBACK IN PULSED MOTOR WINDINGS

Arthur A. Pershall, Machesney Park, and George H. Holling, Roscoe, both of Ill., assignors to Pacific Scientific Company, Anaheim, Calif.

Filed Aug. 6, 1984, Ser. No. 637,850
Int. Cl.[4] H02P 6/02
U.S. Cl. 318—254 33 Claims



1. In a d.c. motor having a magnetic field multipole rotor and plurality of stator phase windings with switching means to sequentially connect the windings to a d.c. voltage source as the rotor turns through successive angular regions, a flyback circuit associated with at least one of said windings and comprising, in combination

(a) means constituting a normally non-conductive current flow path in parallel with the winding, said means including an element which, when enabled, makes said path conductive with substantally negligible opposition to current flow,

(b) means responsive to the voltage across said winding for setting said element into an enabled state when said voltage (i) is of the polarity created by inductive flyback action and (ii) exceeds a predetermined threshold magnitude, and

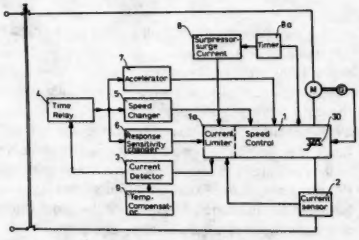
(c) means for restoring said element to its disabled state, after it has been enabled, when current flow therethrough falls essentially to a predetermined low value.

4,574,226

METHOD AND APPARATUS FOR CONTROLLING AN ELECTRIC MOTOR THE ROTATIONAL SPEED OF WHICH IS AUTOMATICALLY REDUCED IN NO-LOAD IDLING OPERATION

Alfred Binder, Bisingen, Fed. Rep. of Germany, assignor to Kress-Electrik GmbH & Co., Bisingen, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,268
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335237
Int. Cl.[4] H02P 7/38
U.S. Cl. 318—317 19 Claims



1. A method for controlling an electric motor of the type for driving hand tools, saws, and the like, the rotational speed of which is automatically reduced during no-load idling operation and increased under load to predetermined speeds by sensing the electric motor current and evaluating it for abrupt changes in the effective voltage supplied to the motor, comprising the steps of:

(a) automatically changing the sensitivity range of the current-sensing means to a higher threshold value upon transition of the motor to a higher speed under load conditions; and

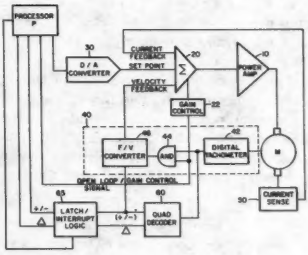
(b) delaying for a predetermined time resetting the motor to a lower idling speed after transition to the no-load condition.

4,574,227

DUAL MODE SERVO

John C. Herder, and Randall G. Guay, both of San Antonio, Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Nov. 14, 1983, Ser. No. 550,950
Int. Cl.[4] G05B 11/18, 13/00
U.S. Cl. 318—594 7 Claims



1. A servo positioning system for controlling a servo motor to a selectable target position, comprising:

(a) processor means responsive to the motor position relative to the target position to provide (i) a current-control set point signal, and when the motor is translated to a preselected open-loop position near target position, (ii) a gain control and an open-loop signal;

(b) a servo power amplifier responsive to a current control signal from a summing amplifier to provide current to the servo motor; and

(c) a velocity feedback loop responsive to the velocity of said servo motor to provide a velocity feedback signal unless disabled by said open-loop signal;

(d) said summing amplifier being responsive (i) to said current-control set point signal, and (ii) said velocity feedback signal unless disabled by an open loop condition, to provide said current control signal to the servo power amplifier;

(e) said summing amplifier being switchable from a high gain state at the beginning of motor advance to a low gain state at an open-loop position selectably proximate to the target position in response to said gain control signal;

(f) such that when said motor is proximate to target position, said summing amplifier is switched to its low gain state and said velocity feedback signal is disabled, opening the velocity feedback loop;

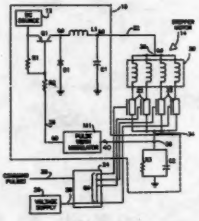
(g) the output of said power amplifier, and therefore the velocity of the motor, being thereby determined by said set point.

4,574,228

CURRENT CONTROLLED MOTOR DRIVE CIRCUIT

Larry A. Blue, Bahama, and David E. Conner, Cary, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,336
Int. Cl.[4] H02P 8/00
U.S. Cl. 318—696 9 Claims



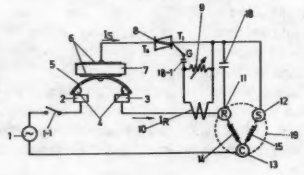
1. A circuit arrangement for driving a motor comprising:
first means operable for generating a DC voltage signal;
a chopper circuit means operable for correlating the voltage signal with an input drive signal and to output a modified DC voltage signal whose on-to-off time ratio is being dictated by a duty cycle of the input drive signal;
a filtering means operable for averaging the modified DC voltage signal and for supplying the averaged voltage signal to the motor;
a second means coupled to said motor and operable for monitoring current flow therethrough and for providing an error signal representative of said current; and
a third means responsive to the error signal and operable to generate and output the input drive signal whose duty cycle is being controlled by the error signal.

4,574,229

POWER EFFICIENT MOTOR STARTER AND CIRCUIT BREAKER FOR AN INDUCTION MOTOR

In S. Kim, Samig Apart 10 - dong 615, Cheongdam - dong Kangnam - Ku, Seoul, Rep. of Korea

Filed Dec. 27, 1983, Ser. No. 565,870
Claims priority, application Rep. of Korea, Oct. 20, 1983, 82-4954; Nov. 30, 1983, 83-10159[U]; Dec. 29, 1983, 82-10514[U]
Int. Cl.[4] H02P 1/24; H02H 7/085
U.S. Cl. 318—788 6 Claims



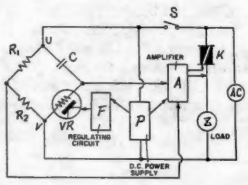
1. A starting and thermal overload protection circuit for a motor having at least one main coil and a starter coil arranged in parallel comprising:
a power source having at least first and second power supply terminals, said first power supply terminal serially connected to said motor coils;
overcurrent protection means for protecting said motor from an overcurrent, said overcurrent protection means including,
a conductive bimetallic contact support, and
at least one moveable contact mounted thereon interacting with a stationary contact,
said stationary and moveable contacts and said bimetallic support being serially connected between said second power supply terminal and said main coil to provide power from said power source to said motor, said moveable contacts being normally in contact with said stationary contacts, said bimetallic contact support moving said moveable contact away from said stationary contact when an overcurrent heats said bimetallic contact support; and
means for supplying a starting current to said motor coil, said means for supplying including,
a positive thermal coefficient resistance mounted in juxtaposition to said bimetallic contact support and electrically connected thereto,
a triac serially connected between said positive thermal coefficient resistance and said starter coil for controllably supplying current thereto for motor starting,
current sensing means for detecting current supplied said main coil by said power source,
means, operatively interconnected between said triac and current sensing means, for gating said triac ON only in response to a detected current substantially greater than the normal current supplied to said main coil during normal operating conditions, and
a phase control capacitance interposed between said triac and said means for gating and ensuring substantially complete conduction of said triac when gated ON by said means for gating.

4,574,230

PHASE-REGULATED SWITCHING CIRCUIT

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed May 14, 1984, Ser. No. 610,252
Int. Cl.[4] G05F 1/455
U.S. Cl. 323—242 1 Claim



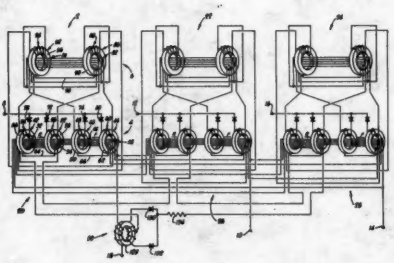
1. A phase-regulating switching circuit for ac electric equipment, essentially consisting of:
a bidirectional triode thyristor;
an amplifier connected at its output terminal to one gate of the bidirectional triode thyristor;
an ac Wheatstone bridge bearing in one arm a variable resistance comprising one of a photocoupler or a thermistor, said Wheatstone bridge being connected at one branch to the input terminal of said amplifier and at its other branch between the cathode and anode of the bidirectional triode thyristor through an ac electric equipment;
an RC phase regulating circuit having a time constant connected to the variable resistance; and
means for supplying a dc energy to said amplifier and the RC phase regulating circuit.

4,574,231

MAGNETIC AMPLIFIER APPARATUS FOR BALANCING OR LIMITING VOLTAGES OR CURRENTS

Donald W. Owen, 801 Brookwood Dr., Apartment 108, Oklahoma City, Okla. 73139

Filed Apr. 4, 1984, Ser. No. 596,726
Int. Cl.[4] G05F *1/335*
U.S. Cl. 323—253 27 Claims



1. An apparatus for controlling the magnitude of an alternating current electrical signal, said apparatus comprising:

first variable impedance means for providing first and second electrical paths, each of said first and second electrical paths having a respective impedance which is variable in response to an effectively direct current control signal;

connector means for connecting each of said first and second electrical paths with a source of electrical current so that alternating electrical currents can flow through each of said first and second electrical paths;

second variable impedance means for providing a third electrical path having an impedance which is variable in response to currents flowing through said first and second electrical paths; and

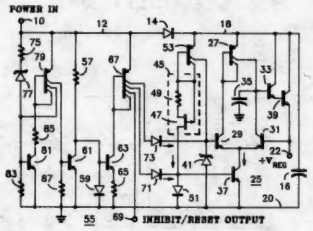
connecting means for connecting said alternating current electrical signal to said third electrical path so that the magnitude of said alternating current electrical signal is controllable by varying the impedance of said third electrical path in response to said control signal.

4,574,232

RAPID TURN-ON VOLTAGE REGULATOR

Thomas J. Petty, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 21, 1983, Ser. No. 544,931
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—268 9 Claims



1. A rapid turn-on voltage regulator comprising:

amplifier means, including negative feedback, for providing a regulated voltage source at an output thereof,

a power source coupled to said amplifier means;

a current source coupled to said amplifier means and said power source for providing a relatively small bias current to said amplifier means; and

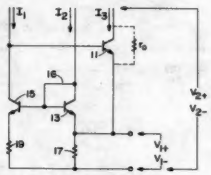
current pulse generating means coupled to said amplifier means and said power source for providing a pulse of current which is large relative to the bias current, to said amplifier means to rapidly bring said amplifier means to an operating level.

4,574,233

HIGH IMPEDANCE CURRENT SOURCE

Stewart S. Taylor, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 30, 1984, Ser. No. 595,227
Int. Cl.[4] G05F *3/26*
U.S. Cl. 323—316 3 Claims



1. A current source having a high output impedance, comprising:

a first bipolar transistor for producing an output current at its collector;

a first resistor connected between the emitter of the first transistor and a reference potential level, whereby the potential at the emitter of the first transistor is representative of the output current of the first transistor;

a second bipolar transistor having its emitter connected to the emitter of the first transistor and its base coupled to its collector;

a third bipolar transistor having its base connected to the base of the second transistor and its collector coupled to the base of the first transistor; and

a second resistor connected between the emitter of the second transistor and said reference potential level,

whereby when the collectors of the second and third transistors are connected to first and second constant current sources respectively, changes in the potential at the emitter of the second transistor bring about corresponding changes in the potential at the base of the third transistor, and changes in the potential at the base of the third transistor bring about changes in the base current of the first transistor.

4,574,234

SYSTEM FOR MEASURING SELECTED PARAMETERS OF ELECTRICAL SIGNALS AND METHOD

Michael Inbar, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Sep. 26, 1984, Ser. No. 654,809
Int. Cl.[4] G01R *15/12, 23/12*
U.S. Cl. 324—73 R 17 Claims

1. An electrical measuring system for measuring selected parameters of electrical signals having a frequency within a known frequency range wherein said electrical signals are derived by relative movement between magnetic transducers and a magnetic medium having prerecorded data thereon and the measured selected parameters are represented by digital output signals, said system comprising

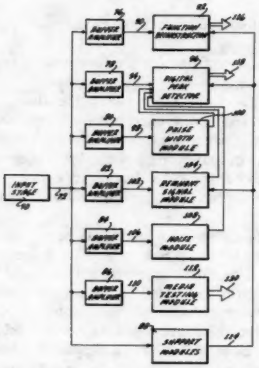
input means including automatic amplifying means for receiving said electrical signals and for selectively amplifying said electrical signals to a preselected amplitude level;

a digital peak detecting means for sequentially producing a digital representation of a plurality of processed electrical

signals and for producing a digital representation of the peak value for each processed electrical signal applied thereto representing the selected parameters of the electrical signals, said digital peak detecting means including means for sampling the signals applied thereto at a frequency which is less than the frequency of the input electrical signals;

a first means operatively coupled to said input means for receiving and applying said preselected amplitude level electrical signals to a function reconstruction means for producing a sample value function representative of the amplitude of the preselected amplitude level electrical signals at the sampling instant and for applying said peak detection signal to said digital peak detecting means for producing a digital representation of the peak amplitude of said sampled electrical signals;

a second means operatively coupled to said input means for receiving said preselected amplitude level electrical signals and producing an overwrite signal representing the amplitude of a remnant signal having a frequency within a known frequency range which is present in the preselected amplitude level electrical signals and for applying the same to the digital peak detecting means for producing a digital output signal representative of the magnitude of the overwrite signal;



a third means operatively coupled to said input means for receiving said preselected amplitude level electrical signals and producing therefrom a train of known amplitude pulses having a known period and a variable pulse width which is a function of the width of the pulse widths of the preselected amplitude level electrical signals and deriving therefrom an integrated voltage signal representative thereof and applying the same to the digital peak detecting means to produce a digital representation of the average pulse widths; and

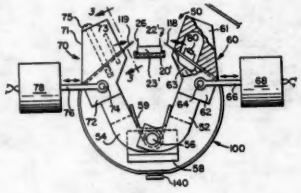
a fourth means operatively coupled to said input means for receiving said preselected amplitude electrical signals and producing a direct current voltage signal representative of the power of noise spectra signals within said preselected amplitude level electrical signals and applying the same to the digital peak detecting means for producing a digital representation of the power of said noise spectra signals.

4,574,235

TRANSMISSION LINE CONNECTOR AND CONTACT SET ASSEMBLY FOR TEST SITE

Thomas C. Kelly, White Bear Lake; Robert J. Wurscher, Shoreview; Dennis M. Petrich, Wayzata, and Earl H. Rideout, Coon Rapids, all of Minn., assignors to Micro Component Technology, Inc., Shoreview, Minn.

Filed Jun. 5, 1981, Ser. No. 270,709
Int. Cl.[4] G01R *31/02, 1/06*
U.S. Cl. 324—158 F **23 Claims**



1. Apparatus for selectively making electrical contact between contacts of a contact set assembly and contact elements of an electrical device to be engaged thereby, comprising:

said contacts set assembly, wherein said assembly includes:

(i) a flexible insulating layer having opposed, substantially parallel first and second surfaces and first and second spaced edges; and

(ii) a plurality of controlled impedance conductive lines disposed generally parallelly on said first surface in laterally spaced relationship, each of said lines having a first terminal portion adjacent said first edge of said insulating layer and a second terminal portion remote from said first terminal portion;

first means for selectively flexing said insulating layer with said controlled impedance conductive lines disposed on said first surface thereof, to urge said first edge toward said second edge;

second means providing electrical connections to said second terminal portions of said lines; and

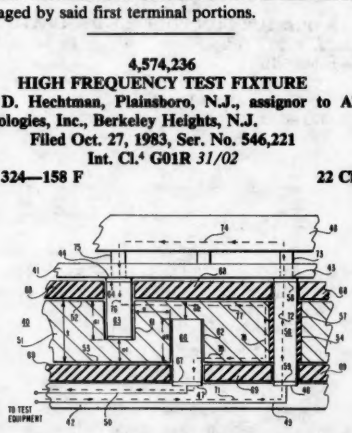
third means for introducing an electrical device to be contacted into a station between said first and second edges, wherein, as said first means flexes said insulating layer, contact elements of an electrical device in said station are engaged by said first terminal portions.

4,574,236

HIGH FREQUENCY TEST FIXTURE

Charles D. Hechtman, Plainsboro, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 27, 1983, Ser. No. 546,221
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F **22 Claims**



1. A test fixture comprising:

a support body having first and second substantially parallel,

electrically conductive major surfaces in electrical contact with each other;

a double-ended probe extending through said support body beyond said first and second major surfaces thereof, said probe being insulated from first and second surfaces;

a first probing element in electrical contact with, and extending from said first major surface so as to be positioned proximate to one end of the double-ended probe;

a second probing element in electrical contact with and extending through said second major surface so as to be positioned proximate to the other end of the double-ended probe; and

the first and second probing elements are electrically interconnected to each other by said first and second major surfaces which serve to pass a high frequency signal therealong between the first and second probing elements.

4,574,237

ROTARY SPEED MEASURING APPARATUS

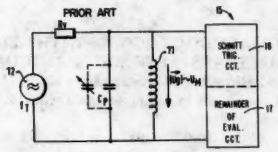
Hansjörg Hachtel, Weissach, and Klaus Dobler, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,301

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242109

Int. Cl.⁴ G01P *3/48, 3/54*

U.S. Cl. 324—173 **4 Claims**



1. Apparatus for measuring rotary speed of a body by means of a measuring wheel (10) drivingly connected to said body and a coil (11) conducting an alternating electric current of a predetermined frequency (f_{TM}), said coil being disposed in the neighborhood of said wheel so as to provide a signal (U_g) dependent upon the speed of said wheel, which signal is produced by the change of the inductance of said coil during the measurement, means being provided for evaluation of said signal by a circuit responding to a voltage reaching a predetermined threshold voltage (U_T), in which apparatus there is the improvement comprising:

periodically repetitive marking features (13*a*, 13*b*) disposed in the circumferential direction of said wheel which comprise, within every period of the periodicity of the repetition of said marking features, at least one zone (13*a* or 13*b*) consisting of ferromagnetic material and at least one zone (13*b* or 13*a*) consisting of diamagnetic or paramagnetic but nevertheless electrically conducting material, and

means for providing as said threshold voltage (U_T) a voltage approximately equal to the voltage (U_{ML}) that would be provided as said signal (U_g) by said coil when said wheel is infinitely far therefrom, said ferromagntic material or said frequency (f_{TM}) both being so chosen that the magnetostatic effect is greater than the eddy current effect in said zones consisting of ferromagnetic material.

4,574,238

PROJECTILE SPEED MEASURING APPARATUS

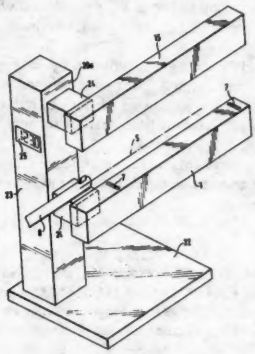
Leopold Weinlich, Industriestrasse 6, D-6831 Reilingen, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,450

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318378

Int. Cl.⁴ G01P *3/66, 3/80*

U.S. Cl. 324—178 **29 Claims**



1. Projectile speed measuring apparatus, particularly to determine muzzle velocity of a projectile fired from a handgun or other small arm in the direction of a measuring path (5) along which the projectile is adapted to pass, comprising

two light gates located in spaced positions at a predetermined distance from each other along said measuring path (5);

a light responsive element (2) positioned at each one of the light gates;

a screen shielding the light gates and the light responsive elements from the projectile and being formed with an aperture (7) for each light gate;

and electronic response evaluation circuit coupled to the light responsive element providing an output signal representative of the speed of the projectile,

and comprising, in accordance with the invention,

a separating wall (4) located essentially parallel to said measuring path (5), the measuring path being located at one side thereof,

said separating wall (4) forming said screen, being formed with said apertures (7) extending from a zone close to the muzzle of the gun and positioned beyond the light responsive elements farthest from the muzzle;

the light responsive elements (2) being located at the other side of the separating wall, to protect the light responsive elements against damage due to the projectiles (6) in the event of misaiming or misfiring of the gun, and to then provide a glancing surface for the projectile and to prevent ricochets.

4,574,239

METHOD FOR FLOW MEASUREMENT USING NUCLEAR MAGNETIC RESONANCE

Jerome R. Singer, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 19, 1983, Ser. No. 515,336

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—306 **34 Claims**

1. A method for generating a detectable signal related to the rate of linear displacement, in a predetermined direction, of nuclei within an object under the influence of a static undirectional magnetic field and within the range of an NMR detector oriented to detect a zero signal when the spins of said nuclei

are equilibrated to precessions at Larmor frequencies in accordance with the intensity of said magnetic field and a positive signal when said spins are excited away from said equilibrated state by a predetermined energy increment, said method comprising:

(a) equilibrating the spins of said nuclei to precess at said Larmor frequencies,

(b) selectively exciting a predetermined volume within said object to an extent which would be sufficient to generate a net NMR signal of zero when combined with the excitation corresponding to said predetermined energy increment,

(c) selectively exciting said volume by said predetermined energy increment at a first predetermined relaxation time interval after the excitation of step (b) but within the full spin-lattice relaxation time thereof to generate a detectable NMR response, and

(d) repeating steps (b) and (c) in sequence at least once using further predetermined relaxation time intervals of differing duration.

4,574,240

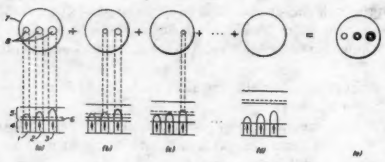
METHOD FOR FLOW MEASUREMENT USING NUCLEAR MAGNETIC RESONANCE

Joel M. Libove, and Jerome R. Singer, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 19, 1983, Ser. No. 515,332

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—306 **40 Claims**



1. A method for generating a detectable signal related to the linear displacement, in a predetermined direction, of nuclei within an object under the influence of a magnetic field and within the range of sensitivity of an NMR detector, comprising:

(a) aligning the spins of said nuclei with said magnetic field;

(b) exciting said nuclei to generate in said detector a signal of the type requiring a plurality of discrete excitations at least two of which are separated by a predetermined time interval of finite duration, by confining two of said separated excitations to a first selected planar volume and a second selected planar volume, respectively, both of which are substantially perpendicular to said predetermined direction and laterally coextensive with each other, with at least a portion of each said volume lying outside the other along said predetermined direction; and

(c) detecting the presence of said signal as an indication of the movement of nuclei from said first planar volume to said second planar volume during said predetermined time interval.

4,574,241

MARINE SURVEYING APPARATUS AND METHOD FOR LOCATING PIPELINES BURIED UNDER THE SEABED

C. L. Jack Stelly, P.O. Box 53353, Lafayette, La. 70505

Filed Aug. 22, 1983, Ser. No. 525,017

Int. Cl.[4] G01V *3/165;* **E21B** *7/12, 7/26;* **E02D** *21/00*

U.S. Cl. 324—326 **13 Claims**

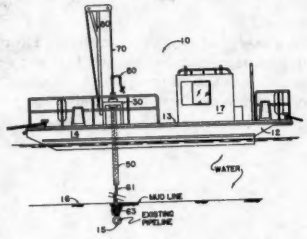
7. A method of marine surveying for hidden pipelines that are buried under the seabed, comprising the steps of:

a. preliminarily determining the approximate location of the pipeline;

b. vertically positioning a casing above the pipeline to be located with a marine vessel having a laterally adjustable support that holds the casing in a vertical position;

c. movably supporting an elongated probe rod with the casing so that the probe rod can be elevated and lowered along a generally vertical path defined by the casing;

d. thrusting the probe rod downwardly through the casing



and into the underlying seabed while the casing laterally supports the probe rod;

e. sequentially moving the casing position with the adjustable support into a number of laterally spaced preselected prospective sites to be probed until the pipe is contacted by the probe so that the pipeline horizontal elevation and the location at the probe site can be measured, each prospective site being surveyed by thrusting the probe rod downwardly through the casing and into the underlying seabed.

4,574,242

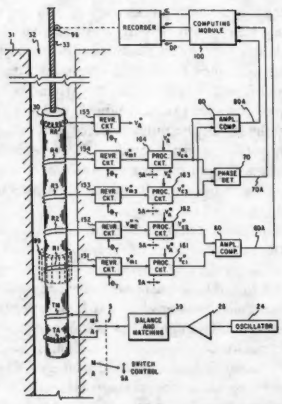
ELECTROMAGNETIC LOGGING WITH REDUCTION OF SPURIOUS TRANSVERSE MAGNETIC COMPONENTS

Brian Clark, Ridgefield, Conn., and Gerald S. Huchital, Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,097

Int. Cl.[4] G01V *3/30*

U.S. Cl. 324—338 **28 Claims**



17. Apparatus for determining properties of formations surrounding a borehole, comprising:

an elongated logging device moveable in the borehole;

a main transmitter and an auxiliary transmitter mounted on the device;

a main receiver and an auxiliary receiver mounted on the device in spaced relationship to the transmitters;

means for energizing the main transmitter with electromagnetic energy;

means for energizing the auxiliary transmitter with transverse magnetic electromagnetic energy;

means for adjusting the energizing of the auxiliary transmitter in accordance with the transverse magnetic electromagnetic energy component received at the auxiliary receiver.

4,574,243

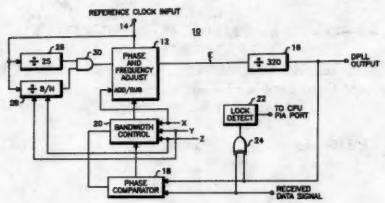
MULTIPLE FREQUENCY DIGITAL PHASE LOCKED LOOP

Stephen N. Levine, Itasca, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1984, Ser. No. 567,715

Int. Cl.[4] H03K *5/13, 5/22;* **H03D** *13/00*

U.S. Cl. 328—155 **2 Claims**



1. An improved multiple frequency digital phase locked loop (DPLL) for processing received data signal and producing an output signal which is phase-locked to the received data signal, comprising:

(a) phase comparator means having first and second inputs, wherein the first input is coupled to the received data signal and the second input is coupled to the DPLL output signal, and an output for providing an output signal indicative of the relative phase between said incoming data signal and said DPLL output signal;

(b) clock means for generating a reference clock signal;

(c) programmable divider means, coupled to said reference clock signal and having an output and programmable inputs, for generating a programmable clock signal related to said reference clock signal according to a divider ratio controlled by said programmable inputs;

(d) digital means, coupled to the output of said programmable divider means for generating first and second derived clock signals, one such signal being in a delayed relation to the other;

(e) phase and frequency adjust means coupled to said clock means for producing a composite clock signal by selectively adding or subtracting said first and second derived clock signals, periodically, at a rate defined by said programmable clock signal to effect a frequency adjustment or by individually adding or subtracting pulses in response to said phase comparator output signal to effect a phase adjustment;

(f) frequency divider means coupled to said phase and frequency adjust means for processing said composite clock signal to produce the digital phase-locked loop output signal.

4,574,244

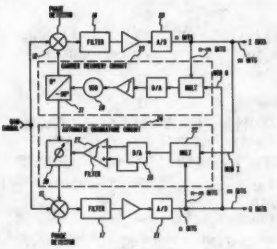
QAM DEMODULATOR AUTOMATIC QUADRATURE LOOP USING N-M LSB'S

Manley J. Head, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1984, Ser. No. 623,802

Int. Cl.[4] H03D *3/18;* **H03K** *9/02;* **H04L** *5/12, 25/02*

U.S. Cl. 329—50 **11 Claims**



1. A system for the demodulation of a Quadrature Amplitude Modulation (QAM) signal, of the type having in-phase and quadrature channels, each having an m bit demodulated output, thereby defining a $2^m \times 2^m$ QAM vector space, said system comprising:

detector means in each of said channels, each detector means responsive to said QAM signal and a signal at a carrier frequency input, and each for generating an analog output;

an analog-to-digital converter, responsive to said analog signal in a first one of said channels, for providing said m bits and a bit group including at least the most significant one of the bits less significant than said m bits in the digital representation of the analog signal;

a control loop including said detector means in said first channel and said analog-to-digital converter, and further including

means for adjusting, in response to a control signal, the phase of a local oscillator signal which is nominally phase aligned with said QAM vector space, and for applying the phase adjusted signal to the carrier frequency input of said first channel detector means, and

means for deriving from said bit group a measure of the phase difference between the phase adjusted oscillator output applied to said first channel and said demodulated output vector space, and for providing a control signal representative of said measure to the means for phase adjusting,

whereby the means for phase adjusting is controlled to provide the local oscillator output to the detector in said first channel in controlled phase alignment with respect to said QAM vector space, for properly demodulating said QAM signal.

4,574,245

MULTISENSOR DEMODULATOR AND A/D CONVERTER

Wilmer A. Mickelson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

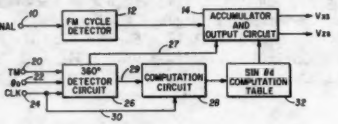
Filed Oct. 5, 1982, Ser. No. 432,874

Int. Cl.[4] H03D *3/00;* **G01P** *9/02*

U.S. Cl. 329—110 **18 Claims**

1. A signal demodulation system comprising: means for receiving a modulated cyclic signal; means for detecting each cycle of said modulated signal; means for selecting a sine value in response to each detected cycle;

means for cumulatively summing the sine values selected during a predetermined interval; and



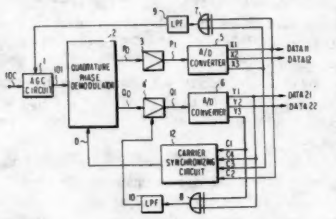
means for providing an output of said summation over said predetermined interval as a demodulated signal.

4,574,246

DEMODULATOR WITH AGC CIRCUIT FOR MULTI-LEVEL QUADRATURE AMPLITUDE-MODULATED CARRIER WAVE

Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 589,265
Claims priority, application Japan, Mar. 16, 1983, 58-43495
Int. Cl.⁴ H03D *3/00*
U.S. Cl. 329—124 **12 Claims**



1. A demodulator with an automatic gain control circuit, comprising:

first control circuit means for varying an amplitude of a multi-level quadrature amplitude-modulated carrier wave in response to a first control signal;

quadrature phase demodulator means for phase-detecting an output of said first control circuit means by reference carrier waves which are different in phase by 90 degrees from each other, and for providing an inphase demodulated signal and a quadrature-phase demodulated signal;

first multilevel discriminator means and second multilevel discriminator means for respectively discriminating said inphase and quadrature-phase demodulated signals with respect to multiple levels and for generating digital outputs;

second control circuit means interposed between said quadrature phase demodulator means and said multilevel discriminator means, for varying an amplitude of one of said inphase and quadrature-phase demodulated signals in response to a second control signal; and

control signal generator means for generating said first and second control signals in response to the outputs of said first and second multilevel discriminator means.

4,574,247

FM SIGNAL DEMODULATOR

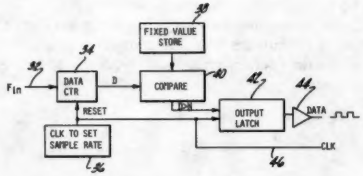
Keith Jacob, Ann Arbor, Mich., assignor to Multi-Elmac Company, Novi, Mich.

Filed May 21, 1984, Ser. No. 612,394
Int. Cl.⁴ A03D *3/04*
U.S. Cl. 329—126 **6 Claims**

1. A method for demodulating an FM signal consisting of at least first and second discrete frequency components f0 and f1 representing data values and for deriving an output signal containing said data comprising the steps of:

sampling the FM signal periodically and at a rate higher than the rate of occurrence of said components;

counting the number of excursions n of said signal during each sample time;



comparing the sample counts n to a number N which is higher than the maximum number of f0 excursions which occur during a sample time and which is lower than the maximum number of f1 excursions which occur during a sample time; and

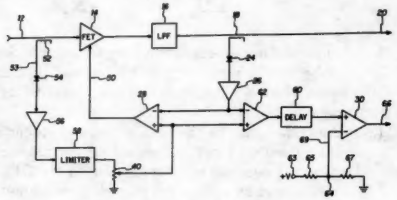
generating an output having a first characteristic when n is less than N and a second characteristic when n is greater than N.

4,574,248

RF POWER AMPLIFIER FOR USE WITH VHF TRANSCEIVERS

Kirk A. Snodgrass, Phoenix, Ariz., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 7, 1984, Ser. No. 607,849
Int. Cl.⁴ H03G *3/20;* **G01R** *21/00*
U.S. Cl. 330—2 **11 Claims**



1. A power amplifier system comprising:

means for providing an input signal;

means for amplifying said input signal and providing an amplified output signal; and

means for comparing a sample of said input signal forming a reference signal with a sample of said output signal for controlling the amplification produced by said means for amplifying to produce a constant gain for input signal levels less than or equal to a predetermined limit and a constant power output for signal levels exceeding said predetermined limit.

4,574,249

NONINTEGRATING LIGHTWAVE RECEIVER

Gareth F. Williams, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 300,376, Sep. 8, 1981. This application Apr. 1, 1985, Ser. No. 718,712
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 330—59 **4 Claims**

1. Apparatus (FIGS. 9, 12, 33/40) for amplifying a NRZ digital optical signal having a bit rate B and bandwidth Δf comprising:

a nonintegrating receiver having an input capacitance C_T and including:

a photodiode for receiving said signal and converting it to an electrical current i_s,

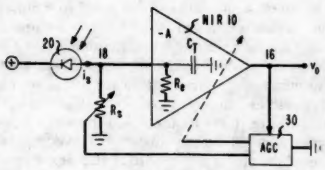
an input terminal to which said electrical current is applied and an output terminal at which an amplified output voltage v_o appears,

a voltage amplifier connected between said terminals, said amplifier having a forward voltage gain $(-A)$ with poles therein at a frequencies f_{ai} outside Δf, and

a negative feedback circuit, connected between said terminals, including a current source for generating a feedback current i_f which is proportional to v_o, said current source having a transconductance g_f which is of opposite sign to A and comprising

a voltage integrator having its input connected to said output terminal and having a pole in its transfer function at a frequency f_i, and

a parallel combination of a feedback resistor R_F and a feedback capacitance C_F connected between said input terminal and the output of said integrator, said combination having a zero in its transfer function at f_i so that said transconductance g_f is essentially constant with frequency within Δf,



the output voltage v_f of said integrator being related to v_o, in the frequency domain, by the relationship $v_f = -v_o/(s+2\pi f_i)$, the equivalent input conductance g_e of said amplifier being given by $g_e = 1/Ag_f$, and for said receiver to be nonintegrating $Aa > 2\pi C_T 0.56B/C_F$,

said feedback circuit in combination with C_T producing a feedback voltage gain β with a feedback pole therein at a frequency f_f within Δf, and said amplifier and said feedback circuit forming a loop circuit having a loop gain $A\beta$, and for stability said feedback circuit pole being the dominant pole in $A\beta$ versus frequency, and

a range extender for preventing the saturation of said receiver at high amplitudes of i_s including

a variable resistor R_s having one end connected to said input terminal, and

an automatic gain control (AGC) circuit responsive to said optical signal for decreasing R_s when i_s reaches said high amplitudes,

said AGC circuit having a threshold below which the output voltage of said amplifier increases with increasing current and above which said output voltage is essentially constant, and

said variable resistor has a high resistance R_{s2} below said threshold and a lower variable resistance R_{s1} above said threshold.

4,574,250

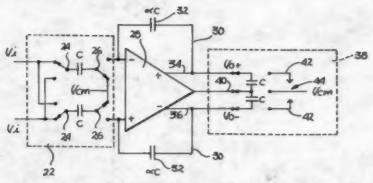
SWITCHED CAPACITOR FILTER UTILIZING A DIFFERENTIAL INPUT AND OUTPUT CIRCUIT AND METHOD

Daniel Senderowicz, Berkeley, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 13, 1981, Ser. No. 311,144

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—258 **3 Claims**



1. In an integrated circuit, a differential integration circuit having first and second inputs comprising:

a balanced output operational amplifier having a negative input terminal and a positive input terminal;

a first balanced switched capacitor sampler coupled to said first and second inputs said first sampler also coupled to said amplifier negative and positive input terminals;

a second balanced switched capacitor sampler;

a positive voltage output of said operational amplifier coupled to said second sampler and fed back to said amplifier negative input terminal through a first capacitor;

a negative voltage output of said operational amplifier coupled to said second sampler and fed back to said amplifier positive input terminal through a second capacitor;

a center voltage output of said operational amplifier equal to the difference between said positive voltage output and said negative voltage output, said center voltage output coupled to said second sampler;

whereby differential signals may be transferred through said circuit such that said circuit has improved power supply rejection and high signal to noise ratio.

4,574,251

LOGARITHMIC DIGITALLY VARIABLE GAIN CONTROLLED AMPLIFIER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 656,821

Int. Cl.⁴ H03G 3/20; G06G 7/24

U.S. Cl. 330—279 **7 Claims**

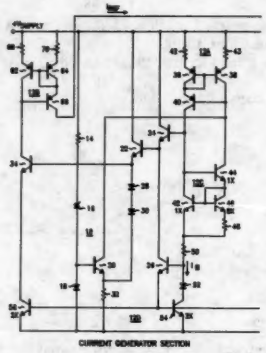
1. An integratable, gain controlled amplifier circuit receiving a binary input signal, said amplifier circuit comprising:

an amplifier having a signal input, a control input and an output and having a gain which is proportional to a control current being applied to said control input;

a current generator for providing a first current;

control means receiving the first current and responsive to the binary input signal for dividing the first current to produce a control current equalling a predetermined fraction of said first current such that the binary input signal

corresponds to a predetermined logarithmic attenuation of the control current; and



means for applying said control current to said amplifier's control input to thereby provide a predetermined logarithmic attenuation in the amplifier.

4,574,252

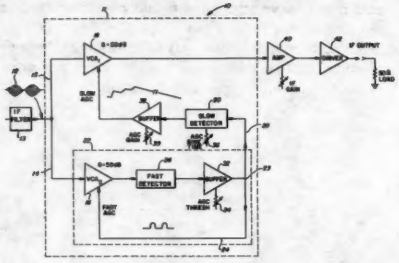
CONSTANT RISE AGC DEVICE

Robert A. Slack, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1985, Ser. No. 715,992

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—281 **10 Claims**



1. A constant rise AGC device comprising:

a primary AGC loop for receiving an input signal from an input terminal and splitting the input signal to input and output components of the primary AGC loop, the input signal to the input component being processed within the primary AGC loop to control the gain of the input signal at the output component of the primary AGC loop;

the primary AGC loop having slow detection means;

a secondary AGC loop within the primary AGC loop, the secondary AGC loop including said input component and having its output connected to the slow detection means; and

the secondary AGC loop having fast detection means for preventing self-imposed saturation;

whereby the secondary AGC loop can be utilized to provide a constant AGC buildup signal for any input signal greater than a predetermined dB range, and the remainder of the primary AGC loop, which receives the constant AGC buildup signal from the secondary AGC loop, can be optimized for desired rise and fall times so that the latter's output signal can be relatively unaffected by interference bursts, signal gaps and fading in the input signal.

4,574,253

BROADBAND CONTROL AMPLIFIER

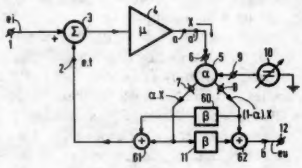
Henri J. Velo, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,380

Claims priority, application Netherlands, Feb. 14, 1984, 8400463

Int. Cl.⁴ H03F *1/34*

U.S. Cl. 350—293 **4 Claims**



1. A broadband control amplifier, comprising an amplifier whose input is connected to the output of a differential combining circuit and whose output is connected to the signal input of a signal splitter having a transfer factor α, a first output of the signal splitter producing an output signal equal to $(1-\alpha)$ times the input signal and which is coupled to the output terminal of the control amplifier, a second output of the signal splitter producing an output signal equal to α times the input signal and which is coupled by a first network to the output of the control amplifier and is further coupled to a first input of the differential combining circuit, a second input of the combining circuit being connected to the input terminal of the control amplifier, characterized in that at least one of the coupling paths of the first output and the second output of the signal splitter includes a second network to compensate for the influence of the transfer factor α of the signal splitter on the open loop gain of the control amplifier.

4,574,254

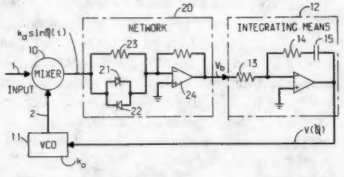
PHASE-LOCK LOOP CIRCUIT PROVIDING VERY FAST ACQUISITION TIME

Bernard Glance, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 613,421, May 24, 1984, abandoned. This application Sep. 7, 1984, Ser. No. 648,241

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—17 **10 Claims**



1. A phase-lock loop arrangement comprising:

a voltage controlled oscillator (VCO) for providing a predetermined frequency output signal in response to a predetermined input control signal;

means responsive to both an input signal to the loop and the predetermined frequency output signal from the VCO for generating an output error signal representative of the difference in phase between the two signals;

means capable of directly transforming the output error signal from the generating means, over a range o predetermined phase differences, into an output signal comprising a predetermined nonlinear response wherein small values of the transforming means output signal are generated which increase linearly away from zero for a small range of values of the output error signal on either side of a zero output error signal and then increase exponentially for output error signals outside said small range of values; and

means responsive to the output signal from the transforming means for integrating the transforming means output signal and generating the input control signal to the VCO which is representative of the resultant integrated signal.

4,574,255

MMC SUBSTRATE INCLUDING CAPACITORS HAVING PEROVSKITE STRUCTURE DIELECTRIC AND ELECTRICAL DEVICES INCLUDING MMC SUBSTRATE

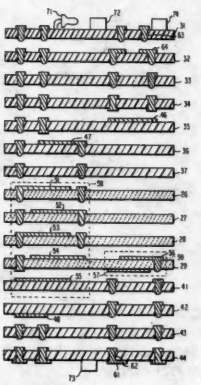
Shuzo Fujii; Yuzo Shimada; Kazuaki Utsumi, and Yutaka Saito, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,506

Claims priority, application Japan, Dec. 15, 1982, 57-219753; Feb. 8, 1983, 58-19201; Feb. 25, 1983, 58-30308; Feb. 25, 1983, 58-30309; Mar. 15, 1983, 58-42576; Mar. 16, 1983, 58-43461; Mar. 16, 1983, 58-43462; Mar. 16, 1983, 58-43482; Mar. 22, 1983, 58-47449; Apr. 4, 1983, 58-57856

Int. Cl.[4] H03L *7/06, 1/02;* **H03B** *5/36;* **G01K** *7/32*

U.S. Cl. 331—25 **37 Claims**



1. In a monolithic multicomponents ceramic (MMC) substrate comprising at least one dielectric layer which is of at least one composition having a perovskite structure, a plurality of insulative layers on both sides of said at least one dielectric layer, a plurality of resistive films on at least one of said dielectric and said insulative layers, said resistive films being resistors, a plurality of pairs of conductive films on both sides of at least one of said at least one dielectric layer, said pairs of conductive films being capacitors, and a plurality of wiring conductors on and through predetermined ones of said dielectric and said insulative layers to form an electrical circuit together with said resistive films and said pairs.

4,574,256

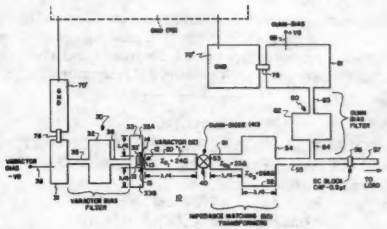
VARACTOR TUNED MICROSTRIP OSCILLATOR FOR KA BAND OPERATION

Donald R. Singh, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 31, 1984, Ser. No. 688,125

Int. Cl.[4] H03B *5/08*

U.S. Cl. 331—107 SL **3 Claims**



1. A planar varactor tuned microstrip oscillator for Ka band operation comprising:

(a) a GaAs Gunn diode having a terminal,

(b) a varactor having an output and a bias connection,

(c) a source of varactor negative bias potential;

(d) a first filter means connected between said source of varactor bias potential and said varactor bias connection,

(e) an impedance inverter microstrip connected between said varactor and said Gunn diode terminal,

(f) a source of Gunn positive bias potential,

(g) an impedance matching transformer having an input and an output,

(h) means connecting said transformer input to said Gunn diode terminal, said transformer output being connected via a DC blocking capacitor to load connection means,

(i) a second filter means connected between said transformer output and said source of Gunn positive bias potential,

(j) ground means, and

(k) second and third capacitive means connected respectively between said sources of bias potential and said ground means,

whereby said varactor tunes said Gunn diode to oscillate in the Ka band.

4,574,257

CRYSTAL RESONATOR OSCILLATOR HAVING CIRCUITRY FOR SUPPRESSING UNDESIRED CRYSTAL HARMONICS

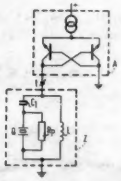
Wolfdietrich G. Kasperkovitz, and Herman W. Van Rumpt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,430

Claims priority, application Netherlands, May 30, 1983, 8301905

Int. Cl.[4] H03B *5/36*

U.S. Cl. 331—116 R **4 Claims**



1. An oscillator circuit comprising:

an amplifier having a reference level connection, and input and output connected to a signal carrying terminal; and

a resonant network having one end connected to said signal carrying terminal, and another end connected to said reference level connection, said resonant network including:

(a) a crystal resonator;

(b) an LC-network coupled to said crystal resonator for selecting a higher order resonator frequency of said crystal resonator; and

(c) a resistor connected in parallel with said crystal resonator for suppressing oscillations at a parasitic oscillation frequency produced from said LC-network and a case capacitance associated with said crystal resonator.

4,574,258

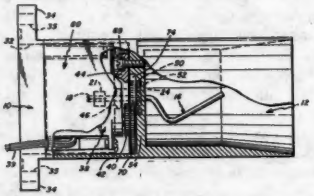
POLARIZED SIGNAL RECEIVING APPARATUS

Donald C. Cloutier, Exeter, N.H., assignor to M/A-COM, Inc., Burlington, Mass.

Filed Aug. 27, 1984, Ser. No. 644,513

Int. Cl.[4] H01P *1/161*; H01Q *3/02*

U.S. Cl. 333—21 A **15 Claims**



15. A polarized signal receiving apparatus comprising;

a first waveguide for transmitting polarized signals,

a second waveguide for receiving polarized signals at one end thereof,

means for securing the first waveguide to the second waveguide,

an antenna means having integrally formed portions including a receiver probe portion disposed in the second waveguide and extending generally axially of the second waveguide, for receiving one polarization of the incident signal, a launch probe portion concentric with the axis of the first waveguide and extending generally axially of the first waveguide for launching said signal therein, and a drive portion intermediate the receiver and launch probe portions, said drive portion including a first drive means,

and a drive source supported in a housing member which defines the first waveguide and comprising at least a second drive means adapted to mesh with the first drive means for driving the antenna means.

4,574,259

HIGH SWITCHING SPEED ELECTRICALLY TUNED MICROWAVE MAGNETIC RESONANCE DEVICES

George T. Rado, McLean, Va.; Carmine Vittoria, Bowie, Md., and James M. Ferrari, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,207

Int. Cl.[4] H01P *1/19*

U.S. Cl. 333—157 **14 Claims**

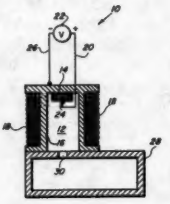
1. An apparatus for changing the phase of a microwave signal comprising:

a microwave cavity

means for producing an axial magnetic field inside the microwave cavity;

a sample, having an anistropy field H_a, that exhibits the magneto-electric effect which allows for changes in the anistropy field H_a of the sample in response to a voltage applied across the sample, said sample being loaded inside said cavity such that said sample is located in the magnetic field produced by said magnetic field producing means;

means for biasing said sample so a voltage difference will lies across said sample; and



means for coupling the microwave signal to said cavity so that said sample in said cavity will absorb the microwave signal and then reemit the microwave signal with a phase shift through said coupling means, the phase shift of the reemitted microwave signal being determined by the voltage induced by the biasing means on the sample.

4,574,260

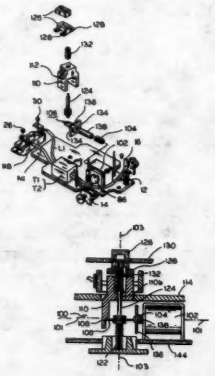
SNAP ACTING SOLENOID OPERATED RESET LATCH MECHANISM

Terry E. Franks, Leicester, N.C., assignor to Square D Company, Palatine, Ill.

Filed Dec. 14, 1983, Ser. No. 561,607

Int. Cl.[4] H01H *83/02, 73/06*

U.S. Cl. 335—18 **18 Claims**



1. A trip free snap acting switch comprising:

a movable contact carrier

movable contacts carried by the carrier and movable into engagement with stationary contacts when the carrier is moved in a first direction to a first position and movable out of engagement with the stationary contacts when the carrier is moved from the first position in a second direction that is opposite the first direction from the first position to a second position,

a movable actuator

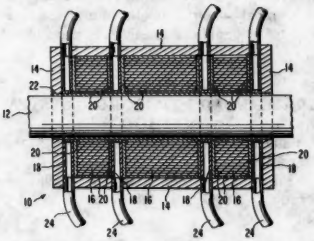
a pair of over center springs positioned between the carrier and the actuator for moving the carrier from the second position to the first position with a snap action movement when the actuator is moved in the second direction to a first actuator position and for moving the carrier from the first position to the second position with a snap action

movement when the actuator is moved in the first direction to a second actuator position,
an operating button and stem member movable between a reset position and a tripped position,
a spring positioned between the stem member and a support constantly urging the stem member in the second direction toward the tripped position,
a movable latch member having a sliding engagement with the stem member and an abutting engagement with the actuator for releasably maintaining the actuator at the second position and the stem member at the reset position when the latch member is at a reset position and permitting movement of the actuator to the first position and the stem member to the tripped position when the latch member is at a tripped position,
and means including a slotted plate and a solenoid for selectively maintaining the latch member at its reset and tripped positions.

4,574,261
BAKEABLE ELECTROMAGNETS

Ronald R. Cochran, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 23, 1985, Ser. No. 768,884
Int. Cl.⁴ H01F *5/00*
U.S. Cl. 335—299 **8 Claims**



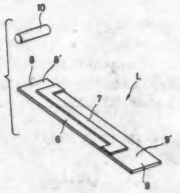
1. A bakeable electromagnet assembly comprising:
a coil of metal foil suitable for baking at 500° C. successive layers of said metal foil being insulated by Kapton film,
at least two cooling plates of high thermal conductivity material suitable for baking at 500° C. adapted to be connected to a source of cooling fluid,
an external shell of material suitable for baking at 500° C.,
a linear of material suitable for baking at 500° C., said coil and cooling plates being contained within said external shell and said liner, and
a powder of high thermal conductivity and low electrical conductivity between said cooling plates and said coil and filling any void within the assembly whereby to insulate said coil and conduct heat away from said coil.

4,574,262
LAMINATION-WOUND CHIP COIL AND METHOD FOR MANUFACTURING THE SAME

Yoshikazu Hamazawa, Yao; Tatsuro Hirai, Neyagawa; Tunenobu Horikoshi, and Tomio Ishida, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1981, Ser. No. 328,636
Claims priority, application Japan, Dec. 9, 1980, 55-177195[U]
Int. Cl.⁴ H01F *15/10, 17/04*
U.S. Cl. 336—192 **8 Claims**

1. A lamination-wound chip coil comprising:
(a) a winding core made of a first magnetic material having the capacity to shrink when subjected to sintering;
(b) a roll of laminate consisting of an elongated magnetic sheet and a conductive strip deposited on said magnetic sheet, said magnetic sheet comprising a second magnetic material having the capacity to shrink when subjected to sintering, said second magnetic material having a greater capacity to shrink than said first magnetic material, said laminate being rolled up around said winding core so as to place said winding core within the roll laminate, said roll laminate and winding core therein being sintered together forming an integral sintered body, said sintered magnetic sheet being shrunk to a greater extent than said sintered

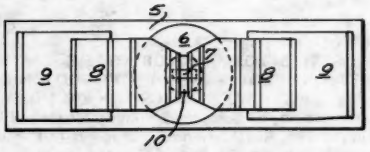


winding core, whereby, a winding tightening pressure occurs between said roll laminate and said winding core, said conductive strip having first and second ends which are respectively positioned at both sides of said magnetic sheet so that said first and second ends are exposed at both sides of the rolled up laminate, and together with said winding core forming an integral sintered body; and
(c) first and second terminal electrodes respectively connected to the both sides of said sintered body at said first and second ends of said conductive strip.

4,574,263
INFRARED RADIATION DETECTOR

Kevin C. Liddiard, Fairview Park, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU81/00130, § 371 Date May 21, 1982, § 102(e) Date May 21, 1982, PCT Pub. No. WO82/01066, PCT Pub. Date Apr. 1, 1982
Continuation of Ser. No. 387,852, May 21, 1982, abandoned. This PCT application Sep. 17, 1981, Ser. No. 742,365
Claims priority, application Australia, Sep. 24, 1980, PE5725
Int. Cl.⁴ H01L *31/08*
U.S. Cl. 338—18 **17 Claims**



1. An infrared radiation detector comprising
(a) a substrate formed of a stable material such as an aluminum oxide ceramic, a glass, a metal having an electrically insulating surface, or a silicon slice, said substrate having a hole therethrough;
(b) a pair of bonding pads spaced apart one on each side of the said hole;
(c) a pellicle having a thickness less than 50 nm to have a low heat retaining capacity and high thermal resistance formed of an insulating or semiconductor material selected from the group consisting of aluminium oxide, silicon dioxide, silicon monoxide, silicon nitride, cryolite, germanium, and silicon, positioned to span the said aperture;
(d) a detector comprised of an essentially straight electrical resistance element fixed on the said pellicle to be posi-

tioned over the said hole, and comprising an ultrathin infrared-absorbing film less than 10 nm thick selected to form both the absorber of infrared energy and a resistance element and selected from the group consisting of nickel, palladium, platinum and iridium such metal being selected to have a low heat retaining capacity and high thermal resistance; and

(e) a pair of thin-film conductive contacts connecting opposite sides of the said detector element to the said bonding pads.

4,574,264

THIN FILM OXYGEN SENSOR WITH MICROHEATER

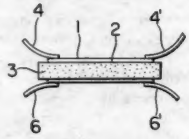
Hideaki Takahashi; Haruyoshi Kondo; Takashi Takeuchi; Kiyoharu Hayakawa, and Hideaki Muraki, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Nov. 15, 1983, Ser. No. 552,201

Claims priority, application Japan, Nov. 17, 1982, 57-200390

Int. Cl.[4] H01L *7/00*

U.S. Cl. 338—34 **5 Claims**



1. A thin film oxygen sensor for furnishing an output signal indicating whether the excess air factor is larger or smaller than 1, said sensor comprising:

a substrate having opposite surfaces;

a sensor portion on one of said surfaces of said substrate and including an oxide semiconductor;

a microheater on the opposite said surface of said substrate; and

a porous catalyst layer on said sensor portion and having a thickness and an average pore diameter such that the ratio of said thickness to said average pore diameter fails within the range of 50 to 3000,

whereby non-combusted components are combusted within said porous catalyst layer thereby furnishing said output signal stably and accurately.

4,574,265

SYSTEM FOR MONITORING THE SENSOR RESPONSIVE TO A PERIODIC CONDITION IN AN INTERNAL COMBUSTION ENGINE

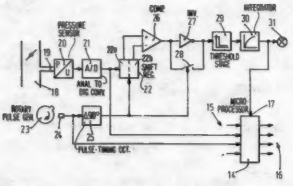
Günther Kaiser, Stuttgart, and Werner Nitschke, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,859

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212561

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—52 R **7 Claims**



1. System for monitoring a sensor of an internal combustion machine when the sensor is responsive to a physical magnitude that varies periodically in step with the operating rhythm of the engine, comprising:

a transducer included in said sensor for producing an electrical output signal representative of said periodically varying physical magnitude;

a timing device (25) for periodically sampling said transducer output signal at intervals equal to an odd multiple, including unity, of one half of the period of a cycle of said periodic physical magnitude (P_u) and for thereby producing a sequence of output pulses representative of the magnitudes of time samples of said transducer output signals;

means (22, 26) for continuously measuring the difference between the magnitudes represented by successive pulses of said sequence and providing an output corresponding thereto, including shift register storage means (22) having an input connected to the pulse output of said timing device (25) and and comparison means (26) connected to said storage means;

means (27,28) for compensating for the alternating reversals of the sign of the differences measured by said difference measuring means (26) in successive difference measurements, and thereby providing an output signal representative of the absolute value of successive differences measured by said difference measuring means (26), and

means for comparing said absolute value output signal with a reference signal of predetermined value, for producing a warning signal when said absolute value signal persistently remains smaller than said reference signal.

4,574,266

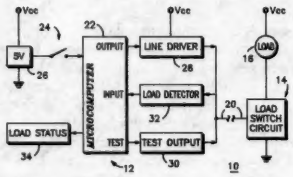
ELECTRICAL LOAD MONITORING SYSTEM AND METHOD

Richard J. Valentine, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 13, 1983, Ser. No. 503,961

Int. Cl.[4] B60Q *1/00;* **G08B** *29/00, 21/00*

U.S. Cl. 340—52 F **4 Claims**



1. A method for detecting an electrical condition of a remote electrical load connected to a source voltage line comprising the steps of:

coupling said load to a common voltage line by means of a load switching circuit having a drive line input thereto;

connecting a load monitor circuit at a drive line output thereof to said drive line input of said load switching circuit by means of a drive line;

providing a test signal at said drive line output; and

detecting a response from said load switching circuit on said drive line in response to said test signal.

4,574,267

TIRE PRESSURE WARNING SYSTEM

Trevor O. Jones, Shaker Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 375,699, May 6, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 744,893

Int. Cl.[4] B60C *23/00*

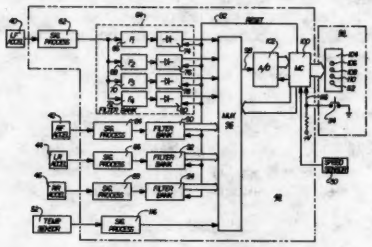
U.S. Cl. 340—58 **15 Claims**

1. Apparatus for detecting changes in inflation pressure of a tire on a vehicle, said apparatus comprising:

means for generating an electric signal indicative of vertical accelerations experienced by said tire, said accelerations exhibiting a resonant frequency dependent upon inflation pressure of said tire;

means for determining a first value of the resonant frequency experienced by said tire at a first time and for determining a second value of the resonant frequency experienced by said tire at a second time, both determined from said generated electric signal indicative of the vertical accelerations experienced by said tire;

means for storing said determined first value of the resonant frequency experienced by said tire;



comparing means for comparing said determined second value of the resonant frequency experienced by said tire with said stored determined first value of the resonant frequency experienced by said tire and for generating a signal indicative of a difference therebetween; and

alarm means responsive to said comparing means for providing an alarm to a driver when said signal generated by said comparing means indicates there is a difference between said stored determined first value of the resonant frequency and said determined second value of the resonant frequency greater than a predetermined amount.

4,574,268

THEFT WARNING SYSTEM

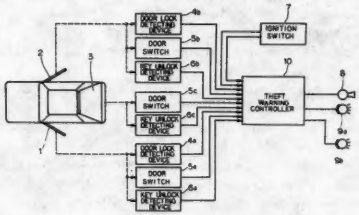
Kenichi Ohnishi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 22, 1985, Ser. No. 704,279

Claims priority, application Japan, May 22, 1984, 59-102839

Int. Cl.⁴ B60R *25/04;* E05B *45/06*

U.S. Cl. 340—64 **11 Claims**



11. A theft warning system for use in a vehicle having a plurality of doors with door lock devices, comprising:

an ignition switch having an open and a closed position and generating a signal indicating whether it is open or closed;

a plurality of door switches, one for each of said doors, each said switch generating a signal indicating when its respective door is open;

at least one detector for generating a signal when at least one of said door lock devices is unlocked;

a plurality of key unlock detectors, one for each of said door lock devices, each said door unlock detector generating a signal when its respective door lock device is unlocked by use of a door key;

a programmed microprocessor receiving the signals generated by said door switches, said detectors, said door unlock detectors and said ignition switch, for setting a theft detecting condition when a last of said doors is closed by an operator outside of said vehicle while all of said door lock devices are maintained in a locked condition, and for generating a theft warning signal when a door is subsequently opened or unlocked without use of a door key; and

means for sounding a horn of said vehicle and flashing headlights and taillights of said vehicle responsive to said theft warning signal.

4,574,269

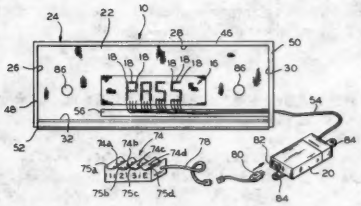
VEHICLE COMMUNICATOR

Gregory R. Miller, 3831 Thyme Dr., #4, Rockford, Ill. 61111

Filed Apr. 10, 1985, Ser. No. 721,882

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—97 **24 Claims**



1. A visual communicator for a rear window of a vehicle comprising:

semi-transparent means adapted to be disposed in said rear window of said vehicle for viewing from outside of said vehicle, said semi-transparent means having a degree of transparency accommodating normal use of an inside rearview mirror of said vehicle by a driver of said vehicle;

a message display unit including a plurality of light emitting diodes arranged in a matrix, said light emitting diodes comprising at least a portion of semi-transparent means and being selectively energizable to emit light, said matrix being disposed in a limited discrete portion of said rear window;

a message control unit for selectively energizing said light emitting diodes, said message control unit being operationally interconnected to said light emitting diodes and being programmed to energize said light emitting diodes in any one of a plurality of preselected patterns, said preselected patterns forming messages for viewing from outside of said vehicle; and

means for selectively actuating said message control unit.

4,574,270

ANALOG-TO-DIGITAL CURRENT CONVERTER

Rudy J. van de Plassche, Sunnyvale, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1983, Ser. No. 498,617

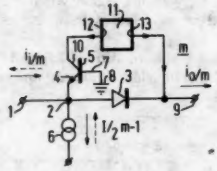
Claims priority, application Netherlands, Jun. 8, 1982, 8202301

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 AD **18 Claims**

1. An analogue-to-digital current converter comprising n stages which each supply one bit and are arranged in series with an input of a stage being connected to an output of a preceding stage, a node in each stage being connected (1) to the input of that stage, (2) to one end of a first diode, whose other end is connected to the output of that stage, (3) to the

emitter of a first transistor in common-base arrangement, and (4) to a reference-current source connected in such a way that for an input current at the input a difference current is produced at the node, said emitter carrying the difference current if said current has the one current direction and the first diode carrying the difference current if said current has the other



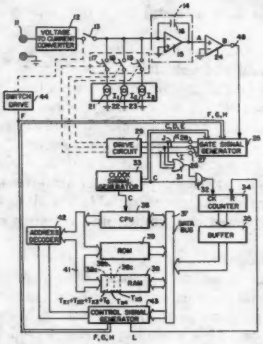
current direction, characterized in that a current-mirror circuit is connected to the collector of the first transistor and to the output of that stage so that said output carries an output current of a value substantially equal to that of the collector current of the first transistor and in a direction that corresponds to the forward direction of the first diode.

4,574,271

MULTI-SLOPE ANALOG-TO-DIGITAL CONVERTER

Eiichi Yada, Gyoda, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1982, Ser. No. 440,411
Claims priority, application Japan, Nov. 9, 1981, 56-179916
Int. Cl.[4] H03K *13/02, 13/20*
U.S. Cl. 340—347 NT **28 Claims**



1. A converter for converting an input analog signal to a corresponding digital value, comprising

a clock for providing clock pulses,

an integrator for integrating signals input thereto and for providing an output corresponding to the integrated value,

a first switch for inputting said input analog signal to said integrator during a first time period of predetermined length corresponding to a respective number of said clock pulses,

a first reference signal and a second switch for inputting said first reference signal to said integrator together with said inputting of said analog input signal, said first reference signal having polarity opposite that of said input analog signal and a magnitude that is preselected to be larger than said input analog signal,

a comparator for comparing said output of said integrator with a first reference level, and for providing a corresponding output indicating whether said output of the integrator is larger or smaller than said first reference level,

means for driving said second switch to provide said inputting of said first reference signal to said integrator for a predetermined number of second time periods during said first time period, wherein the length of each said second time period has a predetermined maximum value and a shorter value depending on the occurrence of a change in the output of said comparator and the occurrences of said clock pulses,

counting means for counting said clock pulses during said second time periods,

calculating means for computing the digital value corresponding to the input analog signal based on information including the count values of said counting means during said second time periods,

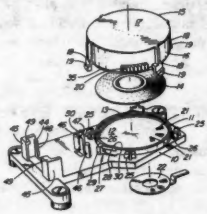
wherein the occurrence of each said shorter value of each said second time period effectively increases the range of the magnitude of the input analog signal that can be converted to said corresponding digital value, and the completion of the computing of the input value corresponding to the digital analog signal involves returning the integrated value output of said integrator to a further reference level.

4,574,272

TONE RINGER FOR TELEPHONE SETS AND OTHER TELECOMMUNICATIONS APPARATUS

Michael Brown, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 13, 1982, Ser. No. 434,117
Int. Cl.[4] G08B *3/00;* **H01L** *41/04*
U.S. Cl. 340—384 R **6 Claims**



1. A tone ringer comprising:

a base member having a bottom surface and a peripherally extending ledge spaced from said bottom surface;

a circular vibratory element resting at its periphery on said ledge;

a top housing having a top surface and a downwardly extending rim;

said rim having an axially extending portion extending downwardly at the inner periphery of the rim, said axially extending portion including a downwardly extending rib, said rib resting on the periphery of said vibratory element;

a plurality of clamping members positioned around said top housing and extending down from the bottom edge of said rim; a plurality of wedging members extending upward from said base housing, a wedging member aligned with each clamping member; an upwardly facing surface on each clamping member and a downwardly facing surface on each wedging member, at least one of the plurality of upward facing surfaces and the plurality of downward facing surfaces being inclined;

each one of said upwardly facing surface adapted to engage under a respective one of said downwardly facing surfaces, relative rotation of top housing and base housing member engaging said upwardly facing surfaces and said downwardly facing surfaces and forcing said to housing

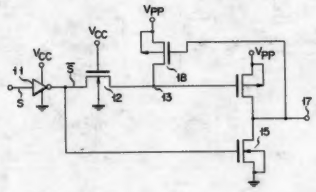
down and deforming said rib to claim said vibratory element on to said ledge.

4,574,273

CIRCUIT FOR CHANGING THE VOLTAGE LEVEL OF BINARY SIGNALS

Shigeru Atsumi, and Sumio Tanaka, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 4, 1983, Ser. No. 548,783
Claims priority, application Japan, Nov. 12, 1982, 57-198596
Int. Cl.⁴ H03K *17/10, 19/094*
U.S. Cl. 307—475 **3 Claims**



1. A circuit for changing a signal voltage level, comprising:
input means for receiving an input binary signal;
gate means, connected to said input means, for generating an output binary signal corresponding to the input binary signal;
a first reference terminal to which a high voltage, higher than the high level of said input binary signal, is supplied;
a second reference terminal to which a constant voltage lower than the high voltage and equal to or higher than the high level of said input binary signal is supplied;
a disconnecting n-channel MOS transistor having a current path with two ends, one end of which is connected to said gate means, and a gate which is connected to said second reference terminal;
inverting means, having a first input terminal which is connected to the other end of the current path of said disconnecting n-channel MOS transistor and a second input terminal which is connected to said gate means, for converting the output binary signal of said gate means to a higher-volage binary signal, said inverting means having an output terminal for providing the converted higher-voltage binary signal; and
feedback means, comprising a p-channel MOS transistor having a source connected to the first reference terminal, a drain connected to said first input terminal of said inverting means, and a gate connected to said output terminal of said inverting means, for causing the voltage level at said first input terminal of said inverting means to be set at said high voltage when the voltage of the converted higher-voltage binary signal reaches a given voltage level,
said disconnecting n-channel MOS transistor electrically isolating said gate means and said second input terminal of said inverting means from the high voltage applied at said first input terminal of said inverting means.

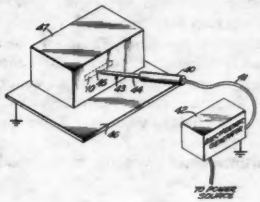
4,574,274

NON-CONTACT ELECTROSTATIC DEACTIVATOR

George G. Pinneo, Fort Lauderdale, Fla., assignor to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Aug. 9, 1982, Ser. No. 406,336
Int. Cl.⁴ G08B *13/24*
U.S. Cl. 340—572 **10 Claims**

1. Apparatus for deactivating a surveillance tag, the detection of which by an interrogation station is dependent upon the condition of a semiconductor contained in said tag, said apparatus comprising an electrode, a source of electrostatic energy coupled thereto for energizing said electrode, and means for establishing an electric current return path to said source, said electrode and means being disposed for association with said surveillance tag such as to cause an electrostatic discharge



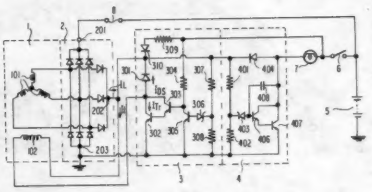
between said electrode and means through said semiconductor in said tag sufficient to degrade said semiconductor and render said tag undetectable by said interrogation station.

4,574,275

BATTERY CHARGE INDICATING CIRCUIT

Mitsuharu Morishita, and Shinichi Kouge, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,541
Claims priority, application Japan, Mar. 23, 1982, 57-47925
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—636 **1 Claim**



1. A circuit for indicating the state of a battery (5) charged by an alternator (1) having a field winding (102) and at least one armature winding (101), comprising:
(a) a full wave rectifier (2) for rectifying the output voltage of an alternator, including a first supply terminal (201) connected with a battery for charging the battery, and a second supply terminal (202) connected with a field winding for exciting the field winding;
(b) a series combination of a diode (404) for preventing reverse charging current and an indicating lamp (7) for showing the charging state of said battery connected between said second supply terminal and said battery;
(c) a voltage regulator (3) for maintaining the output voltage at said first and second supply terminals at a first predetermined value most suitable for charging said battery by controlling the current of said field winding;
(d) switching means including first and second transistors forming a Darlington circuit in which a collector-emitter path of said first transistor (407) is connected between the junction of said diode and said indicating lamp and ground, and a collector-emitter path of said second transistor (406) is connected between a collector and a base of said first transistor;
(e) a voltage divider including first and second resistors (401, 402) connected in series for dividing the output voltage at said second supply terminal of said full wave rectifier;
(f) a Zener diode (403) connected between a junction of said voltage divider resistors and a base of said second transistor and conductive when said output voltage reaches a second predetermined voltage higher than said first predetermined voltage for activating said switching means to

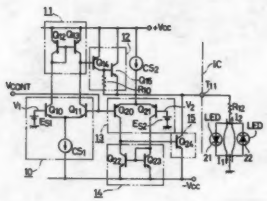
form a current path including said indicating lamp and said battery; and

(g) means for maintaining the indicating lamp steadily and brightly illuminated upon an interruption of the charging connection between the first rectifier supply terminal and the battery rather than dimly flickering due to the cyclic conduction and non-conduction of the Zener diode, said maintaining means comprising a capacitor (408) connected between the collector and the base of said second transistor to be charged when said Zener diode conducts and discharged when said Zener diode ceases to conduct to thus maintain said switching means conductive for a predetermined period.

4,574,276
INDICATING SYSTEM

Tetsuo Sato, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,211
Claims priority, application Japan, Apr. 16, 1982, 57-62438
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—661 13 Claims



1. An indicating system comprising:

(a) a first voltage comparator having a first input terminal connected to receive a first reference voltage and a second input terminal connected to receive a control signal;

(b) a second voltage comparator having a first input terminal connected to receive a second reference voltage and a second input terminal connected to receive said control signal;

(c) first output circuit means having an input terminal connected to an output terminal of said first voltage comparator for producing a current of a first polarity at a common output terminal when the voltage level of said control signal is higher than said first reference voltage;

(d) second output circuit means having an input terminal connected to an output terminal of said second voltage comparator for producing a current of a second polarity at said common output terminal when the voltage level of said control signal is lower than said second reference voltage;

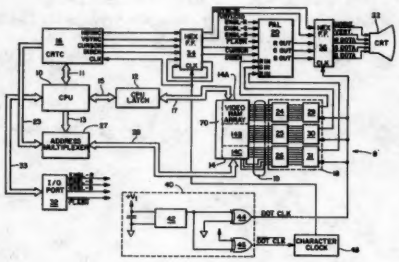
(e) a first indicating device having a unidirectional current characteristic, one end of which is connected to said common output terminal so as to allow the current of the first polarity to flow therethrough and to prevent the current of the second polarity from flowing therethrough; and

(f) a second indicating device having a unidirectional current characteristic, one end of which is connected to said common output terminal so as to allow the current of the second polarity to flow therethrough and to prevent the current of the first polarity from flowing therethrough.

4,574,277
SELECTIVE PAGE DISABLE FOR A VIDEO DISPLAY

Charles A. Krause, Stevensville, and Babu Rajaram, St. Joseph, both of Mich., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 30, 1983, Ser. No. 527,944
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 11 Claims



1. In a raster scanned color video display comprised of a matrix of discrete picture elements, a color control system comprising:

a plurality of memory means each representing a primary color and having a unique storage location for each discrete picture element of said display for the storage of digital memory data signals representative of a respective color component of each of the picture elements of said display;

signal processing means coupled to each of said memory means for reading said digital memory data signals therefrom and for generating a plurality of ENABLE signals each corresponding to a respective one of said memory means in accordance with operating instructions stored in said signal processing means;

control means coupled to said signal processing means and to said plurality of memory means and responsive to said operating instructions for generating timing signals synchronized with the raster scan of said video display; and

circuit means coupled to each of said memory means, said signal processing means, said control means and to said video display and responsive to said ENABLE signals generated by said signal processing means for providing said digital memory data signals from each of said memory means to said display means in accordance with operating instructions stored in said signal processing means and in synchronism with said timing signals from said control means wherein the digital memory data signals from one of said memory means is not displayed if a corresponding ENABLE signal is not received from said signal processing means.

4,574,278
VIDEO SYNTHESIZER

Steven P. Apelman, Long Island, N.Y., assignor to Ragen Data Systems, Inc., Central Islip, N.Y.

Filed May 19, 1983, Ser. No. 496,192
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—722 31 Claims

1. A video synthesizer for an oscilloscope comprising:

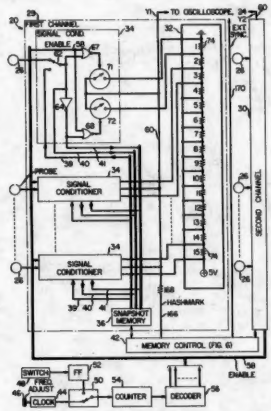
a. means for establishing a set of voltage levels, the voltage levels in said set being distributed in groups wherein each group has a maximum voltage level and a minimum voltage level;

b. means for sequentially combining individual signals of a set of input signals with respective ones of said voltage levels to provide a sequence of combined signals, said combining means including, means for sampling the signals of said set of input signals, and means for substituting a range of said

voltage levels in a group for a range of voltage levels in a corresponding sampled input signal;

c. means for coupling said combined signals to an input terminal of an oscilloscope; and

d. means for adjusting a repetition frequency of said combining



means to be a nonintegral multiple of a repetition frequency of said set of input signals; and wherein

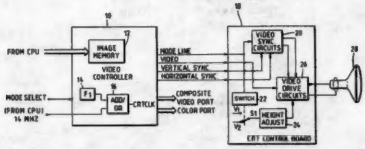
e. the range of voltage levels in one group is different from the range of voltage levels in each other one of said groups for presenting simultaneously representations of said input signals in a spaced-apart format on said oscilloscope.

4,574,279

VIDEO DISPLAY SYSTEM HAVING MULTIPLE SELECTABLE SCREEN FORMATS

Kenneth B. Roberts, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 3, 1982, Ser. No. 438,975
Int. Cl.⁴ G09G *1/16*
U.S. Cl. 340—731 **16 Claims**



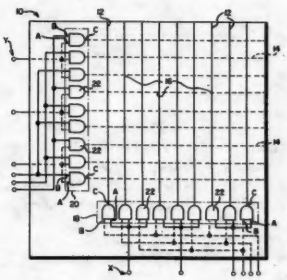
1. A video display system responsive to mode select signals for displaying alphanumeric characters or graphic data in a display field of a video CRT screen having a height adjustment, the CRT operating from horizontal and vertical scan frequencies, the height of the display field determined by the screen format selected where the selected screen format includes a number of horizontal scan lines, the system including a means responsive, respectively, to first and second mode select signals for selecting a first screen format having a first number of horizontal scan lines and a second screen format having a second number of horizontal scan lines, where the height and width of the display field for both said first and second screen formats is the same, and where the first and second screen formats are generated, respectively, from first and second horizontal scan frequencies, said means adapted to generate said alphanumeric characters in either of said selected screen formats where said displayed characters are substantially identical in both said formats.

4,574,280

GAS DISCHARGE LOGIC DEVICE FOR USE WITH AC PLASMA PANELS

Larry F. Weber, Champaign, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.

Filed Jan. 28, 1983, Ser. No. 462,029
Int. Cl.⁴ G09G *3/22, 3/10*
U.S. Cl. 340—771 **14 Claims**



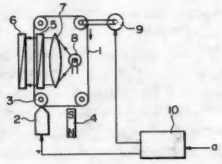
1. An AC gas discharge logic element for generating high voltage pulses to address a plasma panel comprising spaced dielectric members with associated input electrodes (A & B) and an output electrode (C) which is adapted for connection to the plasma panel, the electrodes isolated by said dielectric members from a dischargeable gaseous medium, and said dielectric members, electrodes and gaseous medium responding to signals applied to said input electrodes (A & B) for discharging said gaseous medium and to form a dielectric voltage level at the input electrodes (A & B) after discharge which is different than the initial dielectric voltage level at the output electrode (C) prior to said discharge, thereby enabling the subsequent voltage level of the output electrode (C) after said discharge to approach the formed dielectric voltage level at the input electrodes (A & B).

4,574,281

IMAGE DISPLAY DEVICE

Haruhiko Moriguchi; Yoshiki Kikuchi, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 401,045
Claims priority, application Japan, Jul. 24, 1981, 56-115167
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—783 **8 Claims**



1. An image display device, comprising:

a magnetic film belt including a magnetizable recording medium,

a thermal head for selectively and locally heating desired portions of said recording medium to a temperature close to the Curie point or compensation point in response to a video signal to form a magnetization distribution on said recording medium,

a light source,

a polarizer for polarizing light from said light source,

means for applying said light thus polarized to said magnetic film belt,

an analyzer arranged in the optical path of light output from said belt for obtaining an image corresponding to said video signal, and

means for moving said belt past said thermal head and to said applying means.

4,574,282

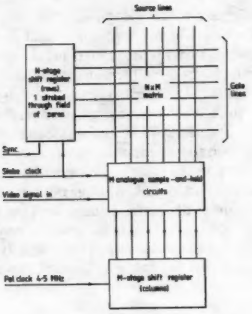
COHERENT LIGHT IMAGE GENERATION

William A. Crossland, Harlow; Jack R. Peters, Dunmow; Peter W. Ross, and Peter J. Ayliffe, both of Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,649

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—784 12 Claims



1. A coherent light imaging arrangement comprising:

means for generating a coherent light image, including,

at least one reflective mode liquid crystal display cell having a liquid crystal layer that is sandwiched between an electroded transparent front plate and a backing plate which includes a semiconductor layer provided with a matrix array of semiconductor gates and a matrix array of reflective electrodes situated at said liquid crystal layer to define respective picture elements in the latter and individually connected to said gates to be addressed thereby, and

a laser operative for directing coherent radiation on said reflective mode liquid crystal display cell; and

means for driving said generating means, including

a drive circuitry connected with said gates and operative for so processing an input video signal as to modulate the optical properties of selected ones of said picture elements in dependence on their positions by developing a selected electric field distribution between the electroded front plate and the individual electrodes of the backing plate in accordance with the information contents of said input video signal, said drive circuitry being operative for repetitively addressing each of the reflective electrodes of the matrix array via the associated gate, and, after each addressing, to close the gate for a predetermined period, and then reopen at least once to discharge a reflective electrode and reclose the gate before refreshing said reflective electrode with its next addressing with data.

4,574,283

DATA TRANSMISSION SYSTEM FOR USE IN AN AIR CONDITIONING CONTROL APPARATUS

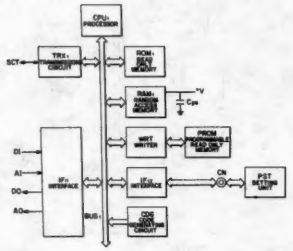
Mutsumi Arakawa, Machida; Junichi Ueno, Ayase; Yozo Kawaguchi, Sendai; Norio Shimura, Kamakura; Shoichi Matsunaga, Hatano, and Kiyoshi Fukaya, Hiratsuka, all of Japan, assignors to Yamatake Honeywell, Japan

Filed Dec. 20, 1982, Ser. No. 451,648

Claims priority, application Japan, Dec. 22, 1981, 56-207442

Int. Cl.[4] H04Q *9/00*; F24F *3/00*

U.S. Cl. 340—825.08 14 Claims



1. A data transmission system for use in an air conditioning control apparatus, said system being composed of a main controller and a plurality of terminal controllers for successively transmitting data to and receiving data from said main controller in response to polling signals from said main controller, said polling signals transmitted in a polling sequence, characterized in that a finally polled one of said terminal controllers transmits an end code indicating that it is the last terminal controller in the polling sequence, said main controller detecting completion of transmission of data to and reception of data from all of the terminal controllers in response to said end code.

4,574,284

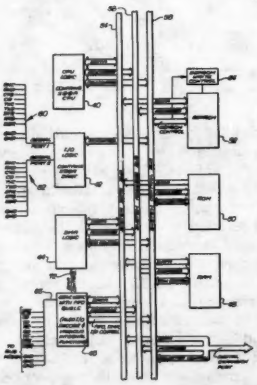
COMMUNICATION BUS INTERFACE UNIT

David G. Feldman, El Segundo, and Hubert M. France, Jr., Palos Verdes Estates, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 26, 1983, Ser. No. 461,282

Int. Cl.[4] H04Q *9/00*; H04J *6/02*

U.S. Cl. 340—825.52 18 Claims



1. For use in a local-area computer network having a communication bus and a plurality of user devices connected to

transmit and receive information over the bus, a bus interface unit comprising:

means for connecting said bus interface unit to a plurality of user devices, each of which is capable of transmitting information to or receiving information from said bus interface unit;

means for connecting said bus interface unit to the communication bus through a plurality of logical ports; and

logical switching means for each user device, switchable between a command mode in which information from the user device is not passed to the bus, and a connected mode in which information from the user device is passed to the bus through its corresponding logical port, and information received from the bus through the same logical port is passed to the user device; and

wherein said logical switching means is also switchable from the connected mode, in which the user device is logically connected to a remote device through the bus, to a talk mode, in which information entered into the user device is automatically transmitted to the connected remote device when a special character is encountered in the information, and information entered into the connected remote device is transmitted to said bus interface unit and is automatically output to the user device when a special character is encountered in the information.

4,574,285

REMOTE CONTROL DEVICE HAVING A PIVOTING CASE COVER

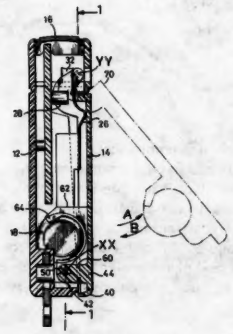
Jacques Bascou, Maule, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 17, 1984, Ser. No. 581,100

Claims priority, application France, Feb. 17, 1983, 83 02554

Int. Cl.⁴ G08C *19/00*; H04Q *9/00*

U.S. Cl. 340—825.69 **8 Claims**



1. An emitter for a remote control device for a locking element, comprising:

a case, a portion of said case forming a cover, said cover being hinged on said case around a first axis of articulation located in the vicinity of a first end of said cover, said cover also being hinged on said case around a movable second axis of articulation parallel to said first axis of articulation and located in the vicinity of a second end of said cover;

a direct current power source mounted in said case;

means mounted in said case for generating a coded message;

electric contact means in said case, said contact means being positioned in said case so as to be actuated by means associated with said second end of said cover upon said cover pivoting about said first axis;

means operatively connected to said direct current power source, said contact means and said means for generating a coded message, for emitting said coded message in response to actuation of said contact means;

means for biasing said second axis of articulation to a position such that said contact means is not actuated by said means associated with said second end of said cover; and

locking and unlocking means for selectively fixing said first axis of articulation;

whereby when said first axis of articulation is fixed by said locking and unlocking means, said cover can pivot about said first axis and in opposition to said means for biasing for actuating said contact means, and whereby when said first axis of articulation is not fixed by said locking and unlocking means, said cover can pivot about said second axis of articulation to open said cover.

4,574,286

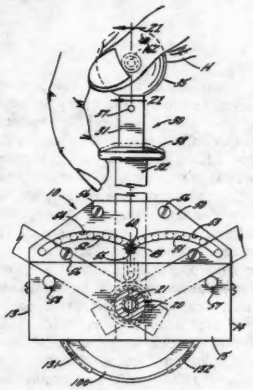
CONTROLLER OF MAGNETICALLY SATURATED TYPE HAVING PROGRAMMED OUTPUT CHARACTERISTIC

Herman J. Andresen, 726 Carriage Hill, Glenview, Ill. 60025

Filed Feb. 28, 1983, Ser. No. 470,165

Int. Cl.⁴ G08C *19/06*; H01H *19/00*; G05G *9/00*

U.S. Cl. 340—870.31 **26 Claims**



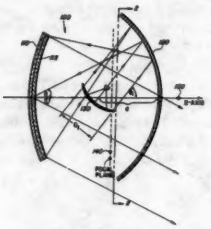
1. In a controller for producing a variable electrical output signal in response to manual manipulation, the combination comprising a frame, a carrier, means for guiding the carrier on the frame for relative forward and reverse movement with respect to the frame, a pair of tubes made of magnetically saturable material, each tube having an elongated sheet-like permanent magnet arranged in parallel proximity, the magnet being rigidly mounted on the carrier and both of the tubes being rigidly secured to the frame, the magnet having a pair of active angled edges separated from one another, the angled edges extending generally in the length dimension of the magnet, the tubes being so oriented and so spaced from one another that they simultaneously, transversely intersect the respective angled edges thereby dividing each tube into a saturated portion and an unsaturated portion, the tubes each being engaged by at least one turn of wire threaded therethrough, a detector circuit having its input connected to the turns of wire and having means for producing an electrical output signal in accordance with the differential magnetic saturation of the tubes, the angled edges of the magnet being so acutely angled with respect to the direction of relative movement that upon such movement the tubes are each progressively engaged by successive portions of the respective angled edges and, depending upon the direction of movement, one of the tubes is progressively more saturated in its longitudinal dimension while the remaining tube is progressively less saturated in its longitudinal dimension thereby to produce a corresponding change in the output signal of the detector circuit, the acute angle being sufficiently shallow so that the active range of relative movement between the carrier and the frame substantially exceeds the length dimension of the tubes.

4,574,287

FIXED APERTURE, ROTATING FEED, BEAM SCANNING ANTENNA SYSTEM

William M. Waters, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1983, Ser. No. 472,330
Int. Cl.[4] H01Q *19/195*
U.S. Cl. 343—756 **7 Claims**



1. A beam scanning antenna system comprising:

a fixed primary reflector for collimating an incident beam of electromagnetic energy, said primary reflector having a generally spherical curvature, a reflecting surface on its concave side, a focal plane and an axis through the vertex of the spherical curvature of said primary reflector, said axis being normal to a plane determined by a circular cross-section of said spherical curvature;

a fixed secondary reflector for collimating an incident beam of electromagnetic energy, said secondary reflector having a generally spherical curvature, a reflecting surface formed of a polarized grid on its concave side, a focal plane, and an axis through the vertex of the spherical curvature of said secondary reflector, said secondary reflector being confocal and coaxial with said primary reflector and being disposed for directing a beam of electromagnetic energy toward the reflecting surface of said primary reflector, and

a rotatable antenna having a surface area smaller than said secondary reflector, said rotatable antenna being disposed for directing a collimated beam of electromagnetic energy toward the reflecting surface of said secondary reflector, whereby a beam of electromagnetic energy emitted by said rotatable antenna will scan the reflecting surface of said secondary reflector.

4,574,288

PASSIVE ELECTROMAGNETIC WAVE DUPLEXER FOR MILLIMETRIC ANTENNA

Gilles Sillard, and Michel Baril, both of Paris, France, assignors to Thomson CSF, Paris, France

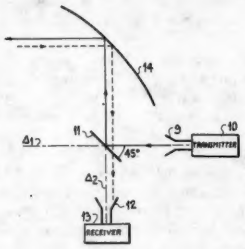
Filed Aug. 26, 1982, Ser. No. 411,958
Claims priority, application France, Aug. 28, 1981, 81 16467
Int. Cl.[4] H01Q *19/10*
U.S. Cl. 343—781 P **9 Claims**

1. A passive duplexer for electromagnetic waves, within a radar system comprising a transmitter operating in the millimetric range, a receiver operating in the millimetric range, and an antenna fed by said transmitter and also redirecting electromagnetic signals received from a target to said receiver, comprising:

a first horn adapted to be connected to said transmitter and having a propagation axis Δ_1;

a second horn adapted to be connected to said receiver and having a propagation axis Δ_2 orthogonal to said axis Δ_1; and

plane circular grid means formed by a dielectric disc metallized on one surface thereof for reflecting or passing incident signals depending upon the power level of said incident signals, said grid means being inclined at a 45° angle with respect to said axes Δ_1 and Δ_2, said metallized surface having a network of resonant slots for passing said incident signals each slot including a diode in conducting relation thereacross.

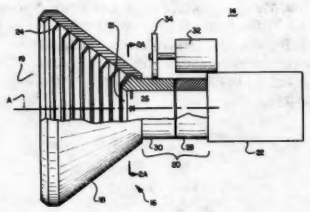


4,574,289

ROTARY SCAN ANTENNA

Albert S. Henderson, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed May 31, 1983, Ser. No. 499,505
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—786 **14 Claims**



1. An apparatus comprising:

a horn antenna having a phase center,

at least one electrically conductive metallic rod-like element located adjacent a wall of said horn antenna at an axial position near said phase center, and

means coupled to said element for rotating said element around said phase center so as to thereby cause the phase center of said horn antenna to also rotate.

4,574,290

HIGH GAIN VERTICALLY POLARIZED ANTENNA STRUCTURE

Kazimierz Siwiak, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 13, 1984, Ser. No. 570,574
Int. Cl.[4] H01Q *9/32*
U.S. Cl. 343—827 **8 Claims**

1. A high gain antenna structure for operation over a predetermined range of frequencies about a predetermined center frequency, comprising:

a hollow vertical conductive cylinder having a first radius about a vertical central axis;

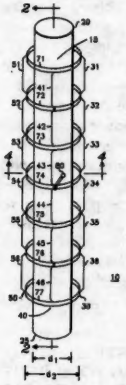
an array of vertical radiating elements disposed around said conductive cylinder at a second radius about said central axis, said second radius being larger in magnitude than said first radius;

said vertical radiating elements being arranged in a plurality of vertical columns and having a number N of vertical

radiating elements in each column, said vertical columns being arranged symetrically about said axis;

distributing means for supplying electrical energy to each of said vertical radiating elements so that the instantaneous current flows in the same direction in all of said vertical radiating elements, and wherein any horizontal currents flowing in said distribution means are substantially cancelled by out-of-phase horizontal currents; and

input means, coupled to said distributing means and positioned within said hollow vertical conductive cylinder,



for receiving an electrical signal and supplying said signal to said distributing means;

wherein N is an even number and wherein said distributing means includes at least N−1 ring parallel transmission lines having radius approximately equal to said second radius, and wherein each of said vertical radiating elements includes an upper and a lower end and wherein each adjacent upper and lower end of vertically adjacent vertical radiating elements is coupled to one of said ring parallel transmission lines.

4,574,291

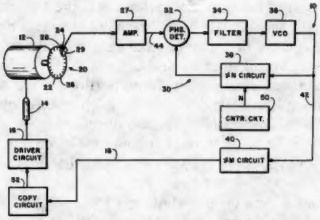
PHASE LOCKED SYNCHRONIZER FOR PRINTER TIMING CONTROL

Guenther W. Wimmer, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 29, 1984, Ser. No. 645,577

Int. Cl.⁴ G01D *15/18, 15/24*

U.S. Cl. 346—75 **16 Claims**



1. An apparatus for generating a trigger signal synchronized with a selectable angular displacement of a rotating object comprising:

a position encoder to monitor the rotation of the rotating object and to produce an output signal proportional to object rotation through a fixed fraction of a revolution,

a frequency multiplier coupled to generate an output signal having a frequency N times the frequency of the position encoder output signal, wherein N is an adjustable number, and

a frequency divider coupled to generate the trigger signal of a frequency comprising a fixed fraction of the frequency of the frequency multiplier output signal, the angular displacement of the rotating object associated with each cycle of the trigger signal being selected by appropriate adjustment of N.

4,574,292

THERMAL HEAD

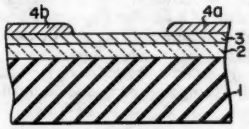
Osamu Takikawa, Kamakura, and Mitsuo Harata, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1984, Ser. No. 675,212

Claims priority, application Japan, Jan. 27, 1984, 59-11851; Jun. 26, 1984, 59-130110

Int. Cl.⁴ E01D *15/10;* **H05B** *1/00*

U.S. Cl. 346—76 PH **8 Claims**



1. A thermal head having a substrate, and a heating resistor of thin film type formed thereon:

wherein said heating resistor is a deposited metal oxide film consisting essentially of ruthenium oxide and an oxide of at least one metal M selected from the group consisting of calcium, strontium, barium, lead, bismuth and thallium, and containing as a main component at least one metal oxide selected from the group consisting of $RuCaO_3$, $RuSrO_3$, $RuBaO_3$, $RuPbO_3$, $RuTlO_{7/2}$ and $RuBiO_{7/2}$, said deposited metal oxide film having an atomic ratio M/Ru of the metal M to ruthenium of 0.6 to 2 and a thickness of 1 micron or less.

4,574,293

COMPENSATION FOR HEAT ACCUMULATION IN A THERMAL HEAD

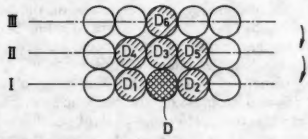
Toshiharu Inui, and Haruhiko Moriguchi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 16, 1984, Ser. No. 611,365

Claims priority, application Japan, May 23, 1983, 58-90324; May 23, 1983, 58-90325; May 23, 1983, 58-90326

Int. Cl.⁴ B41J *3/20;* **G01D** *15/10*

U.S. Cl. 364—76 PH **57 Claims**



1. A heat accumulation compensation method for a thermal head having a plurality of heating elements wherein energy to be applied to each heating element is subjected to control

corresponding to heat accumulation state of said each heating element, comprising:

a first step for calculating the heat accumulation state of said each heating element based on the present and past image information of said each heating element and based on present and past image information of heating elements adjacent to each heating element;

a second step for correcting energy applied to said each heating elements in printing the present line according to said calculated heat accumulation state; and

a third step for controlling energy to be applied to said each heating element in printing the present line based on said corrected energy and information representing the thermal head base plate temperature.

4,574,294

RECORD MATERIAL

Kenneth J. Shanton, Beaconsfield, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Filed Jun. 15, 1984, Ser. No. 621,100

Claims priority, application United Kingdom, Jun. 15, 1983, 8316233

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—210 **10 Claims**

1. Pressure sensitive record material in which the colour forming reaction is produced from a substantially colourless chromogenic material capable of acquiring a positive charge to produce its coloured form and a metal/oxime colour developer capable of engendering the acquisition of a positive charge by the chromogenic material, the chromogenic material and the colour developer being isolated from each other by a pressure sensitive barrier.

4,574,295

CHARGE COUPLED DEVICE HAVING MEANDERING CHANNELS

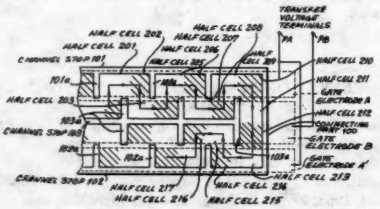
Kunihiro Tanikawa, Akashi, and Osamu Ohtsuki, Kobe, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 963,922, Nov. 24, 1978, which is a continuation of Ser. No. 787,759, Apr. 15, 1977, abandoned. This application Nov. 29, 1984, Ser. No. 676,775

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.[4] H01L *29/78;* **G11C** *19/28*

U.S. Cl. 357—24 **3 Claims**



1. A charge coupled device having a semiconductor substrate and at least two charge transfer routes on the substrate mutually connected to provide a single transfer line bent back on itself, the two charge transfer routes being defined by three spaced parallel band-shaped channel stops, including a central channel stop, formed on said substrate and using in common said central channel stop, said channel stops defining two charge transfer areas therebetween, a plurality of short channel stops alternately extending from each of the band-shaped channel stops toward the center of the charge transfer area, each of the channel stops being a barrier to prevent the transfer of charge, a plurality of cells, each comprising a small area between next-adjacent ones of the short channel stops of a corresponding one of the band-shaped channel stops, said cells being staggered along said charge transfer route, an insulative film covering the charge transfer area, at least three elongated parallel gate electrodes on the insulative film and having transfer voltages applied thereto to induce charge storage sites whereby charges are transferred along said charge transfer route in each channel, a central one of said three gate electrodes commonly covering the cells of said central channel stop of said band-shaped channel stops and being used in common by said two charge transfer routes and another of the gate electrodes commonly covering the cells of an adjacent one of said band-shaped channel stops thereby forming a single directional meander-shaped charge transfer channel in the charge transfer area under a pair of said gate electrodes, said charge coupled device comprising

depletion layer forming means for forming an asymmetrical depletion layer in each of the cells in a regular arrangement to determine a transfer direction of the charge, said depletion layer forming means in said charge transfer routes being arranged in different patterns to provide a reverse transfer direction in each of said routes; and

coupling means between adjacent end cells of said charge transfer routes for permitting forward transfer of the charge, both transfer routes using each one of adjacent band-shaped channel stops of said charge transfer routes, and both charge transfer routes using each adjacent one of said gate electrodes.

4,574,296

GATE TURN-OFF THYRISTOR WITH A CATHODE BASE LAYER HAVING FOUR DISTINCT IMPURITY CONCENTRATIONS

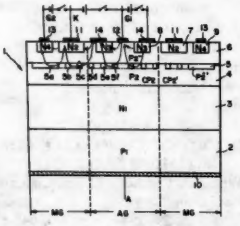
Tetsuro Sueoka, Kawasaki, and Takeharu Kubo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,279

Claims priority, application Japan, Aug. 5, 1982, 57-136721

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 **4 Claims**



1. In a gate turn-off thyristor having an anode A, cathode K, a first gate G_1, a second gate G_2 and a gate current amplifying electrode arranged between the cathode and the first gate, the cathode and the second gate being arranged in a main thyristor portion MG and the first gate and the gate current amplifying electrode being arranged in an auxiliary thyristor portion AG, both the main and auxiliary thyristor portions being formed with a semiconductor device including alternately-different four PNPN semiconductor layers comprised of:

(a) a first P-type layer P_1 having an anode electrode;

(b) a first N-type layer N_1 adjoining said first P-type layer P_1;

(c) a second P-type layer including:

a first-impurity atom concentrations CP_2 and CP_2' layer P_2 both contacting said first N-type layer N_1; and

a second-impurity atom concentration CP_2^- layer P_2^- adjoining said first-impurity atom concentration layer P_2 and under the cathode K and first and second electrodes G_1 and G_2, said second concentration CP_2^-

being of lower concentration than concentrations CP_2 and CP_2'; and

(d) a plurality of second N-type layers formed in the layer P_2^- and including a layer N_2 formed under the cathode, a layer N_3 formed under the gate current amplifying electrode, wherein said first-impurity atom concentration layer P_2 includes an impurity atom concentration CP_2' formed in the main thyristor portion MG having a higher impurity concentration than the impurity atom concentration CP_2 formed in the auxiliary thyristor portion AG, whereby turn-on time and turn-off time of the thyristor are both improved.

4,574,297

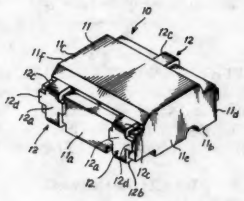
ENCAPSULATED SEMICONDUCTOR WITH TERMINALS HAVING TABS TO INCREASE SOLDER WETTING

Shiro Ooi, Kyoto, Japan, assignor to Rohm Company Limited, Kyoto, Japan

Continuation of Ser. No. 283,730, Jul. 15, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 573,118

Int. Cl.⁴ H01L *23/28, 23/48;* H05K *3/34*

U.S. Cl. 357—68 **5 Claims**



1. A semiconductor device, comprising:

a package of plastic resinous material, said package having a first surface for abutment with a circuit board, a second surface spaced away from said first surface, said second surface including a first central portion flanked by first and second edge portions, said edge portions spaced from said first surface a lesser distance than said central portion, said second surface further including slanted portions connecting said first and second edge portions to said central portion such that said second surface has a mesa-shaped topography, said package further including side surfaces spaced apart from one another and abutting said first surface and said edge portions of said second surface, and end surfaces spaced apart from one another and abutting said first and second surfaces and abutting said side surfaces;

a semiconductor element encapsulated in said package; and

a terminal of said semiconductor element, said terminal including a first portion on one of said side surfaces of said package, said first portion extending to said second surface of said package, said terminal further including a second portion on said one of said side surfaces, said second portion extending from said first portion to both of said end surfaces of said package.

4,574,298

III-V COMPOUND SEMICONDUCTOR DEVICE

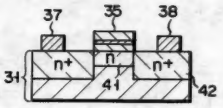
Haruo Yamagishi, Fujisawa, and Hisao Kamo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1983, Ser. No. 565,101

Claims priority, application Japan, Dec. 27, 1982, 57-227057

Int. Cl.⁴ H01L *29/46, 29/64*

U.S. Cl. 357—71 **9 Claims**



1. A semiconductor device comprising:

a III-V compound semiconductor substrate;

a first conductive layer comprising a nitride of a high-melting transition metal of one of Groups IV, V and VI of the Periodic Table formed on said substrate;

a second conductive layer comprising a nitride of a high-melting transition metal of one of Groups IV, V and VI of the Peiodic Table formed on said first conductive layer, said nitride being different in composition from that of said nitride of the first conductive layer; and

an electrode metal layer formed on said second conductive layer.

4,574,299

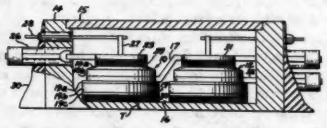
THYRISTOR PACKAGING SYSTEM

Homer H. Glascock, II; Constantine A. Neugebauer, and Harold F. Webster, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 239,719, Mar. 2, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,739

Int. Cl.⁴ H01H *23/36, 23/14*

U.S. Cl. 357—81 **19 Claims**



1. A thyristor packaging system comprising:

(a) an aluminum support having a thickness of less than about 50 mils and having an upper surface;

(b) a first structured metal, strain buffer comprised of a bundle of substantially parallel, closely packed strands of metal wire, said strain buffer having upper and lower surfaces respectively formed from upper, adjacent ends of said strands of metal wire and from lower, adjacent ends of said strands of metal wire, said strain buffer lower surface having a bond with said aluminum support upper surface;

(c) a first conductive strap having upper and lower surfaces;

(d) low thermal impedance and electrically insulating means connecting said first strap lower surface to said strain buffer upper surface;

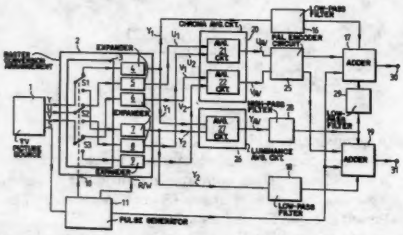
(e) a thyristor having upper and lower surfaces each with an electrode thereon, said thyristor lower electrode having a bond with said first strap upper surface; and

(f) a second conductive strap having a lower surface, said strap lower surface having a bond with said thyristor upper electrode.

4,574,300
HIGH-DEFINITION COLOR TELEVISION TRANSMISSION SYSTEM

Michael G. Hulyer, Crawley Down, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1983, Ser. No. 556,260
Claims priority, application United Kingdom, Dec. 22, 1982, 8236368
Int. Cl.[4] H04N *11/20*
U.S. Cl. 358—11 12 Claims



1. A method of transmitting a high definition color television signal including a wide band television signal having adjacent low and high frequency luminance components and color information and having n lines per picture, said method comprising:

A. converting said wide band television signal into a first narrower band television signal having adjacent low and high frequency luminance portions, m lines per picture, where m is substantially ½n, and field and picture rates which are the same as that for said wide band television signal, wherein said converting step comprises:

(1) deriving the low frequency luminance portion in respective adjacent lines in a field of said first narrower band television signal from said low frequency luminance components in alternate lines in a corresponding field of said wide band television signal;

(2) deriving the high frequency luminance portion in respective adjacent lines in said field of said first narrower band television signal from the average of said high frequency luminance components in respective adjacent lines in said field of said wide band television signal;

(3) deriving color information for respective adjacent lines in said field of said first narrower band television signal from the average of said color information in adjacent lines in said field of said wide band television signal; and

(4) modulating said color information onto a color subcarrier located within the bandwidth of said high frequency luminance portion of said narrower band television signal;

B. transmitting said first narrower band television signal by way of a first transmission path;

C. converting said wide band television signal into a second narrower band television signal having adjacent low and high frequency luminance portions and the same number of lines and field and picture rates as that of said first narrower band television signal, wherein said converting step comprises:

(1) deriving the low frequency luminance portion in respective adjacent lines in a field of said second narrower band television signal from said low frequency luminance components in respective intervening lines in said field of said wide band television signal; and

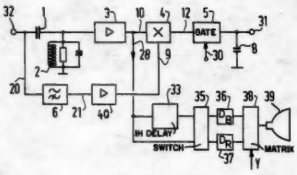
(2) deriving the high frequency luminance portion in respective adjacent lines in said field of said second narrower band television signal from the average of said high frequency luminance components in respective adjacent lines in said field of said wide band television signal; and

D. transmitting said second narrower band television signal by way of a second transmission path, whereby said first and second narrower band television signals may be received together and a wide band television signal having n lines per picture reconstituted therefrom for reproduction as a high definition television display or the first narrower band television may be received alone for reproduction as a color display of standard quality.

4,574,301
SECAM COLOR IDENTIFYING CIRCUIT

Jean-Pierre Sachs, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,997
Claims priority, application France, Aug. 24, 1983, 83 13642
Int. Cl.[4] H04N *9/47, 11/18, 9/45, 9/455*
U.S. Cl. 358—18 4 Claims

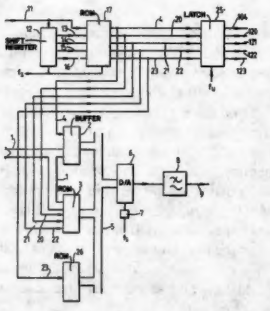


1. A colour identifying circuit forming part of a colour decoding system of the SECAM type, the system comprising a so-called "cloche" pulse-shaping filter (2), said identifying circuit being mainly constituted by a phase comparator (4) coupled to a phase shifting circuit, a so-called "colour identifying burst" signal being applied to one of the two inputs of said phase comparator whilst this signal, after having been conveyed through said phase shifting circuit is applied to the other input, characterized in that the phase shifting circuit is constituted by the cloche pulse-shaping filter (2).

4,574,302
TELEVISION SIGNAL ENCODER

Thomas C. Mackereth, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1983, Ser. No. 558,730
Claims priority, application United Kingdom, Dec. 10, 1982, 8235333
Int. Cl.[4] H04N *9/455*
U.S. Cl. 358—21 R 7 Claims



1. Apparatus for producing a composite video signal having predetermined blanking intervals with preselected transitions from the unblanked to the blanked and the blanked to the unblanked states in response to digital color difference signals and a digital luminance signal applied thereto, comprising

means for processing said digital luminance and color difference signals to create processed digital luminance and

color difference signals having a predetermined blanking amplitude during said predetermined blanking intervals and having said preselected transitions;

means for adding a color burst signal to said processed digital color difference signal thereby creating a final digital signal;

means connected to said processing means and said adding means for generating said composite video signal from said final digital signal and said processed digital luminance signal; and

wherein said means for processing said digital color difference signals comprises first read-only memory means having a first and second set of first memory address inputs and a first memory enable input, means connecting said first set of first memory address inputs to receive said digital color difference signals, means for applying an enable signal to said first memory enable input during said transitions from said unblanked to said blanked and said blanked to said unblanked states, and means for applying further address signals to said second set of first memory inputs during said transition periods, said first read-only memory producing first memory output signals equal to predetermined percentages of said color difference signals, said predetermined percentages corresponding to said further address signals, said processing means further comprising second read-only memory means furnishing a digital blanking level signal when enabled, and means for enabling said second read-only memory means between said transitions from said unblanked to said blanked and said blanked to said unblanked states.

4,574,303

WHITE BALANCE CONTROL SYSTEM FOR COLOR TELEVISION CAMERA WITH AUTOMATIC SWITCHOVER CONTROL

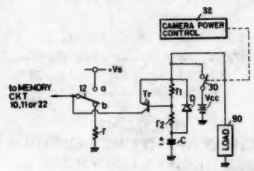
Takaaki Hashimoto, Noda; Ryuzo Motoori, Kawasaki, and Kazushi Minagawa, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

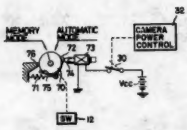
Filed Jun. 21, 1983, Ser. No. 506,459

Claims priority, application Japan, Jun. 24, 1983, 57-107664

Int. Cl.⁴ H04N *9/73*

U.S. Cl. 358—29 **9 Claims**





1. A color television camera comprising:

(a) generation means for generating color signals of an object to be shot;

(b) detecting means for detecting a color temperature of a light illuminating said object and generating at least one detection signal in accordance with said detected color temperature;

(c) control means for controlling said generating means so as to adjust the colors of a picture in accordance with said detection signal;

(d) memory means having automatic and memory control modes, said memory means transmitting said detection signal to said control means in said automatic control mode, and said memory means storing said detection signal and outputting said stored detection signal to said control means in said memory control mode;

(e) selection means adapted to select one of said automatic and memory control modes of said memory means;

(f) power source means for energizing said camera; and

(g) change means responsive to the energizing of said camera by said power source means to change over said memory means to said automatic control mode irrespective of said memory control mode selected by said selection means.

5. A color television camera comprising:

(a) generating means for generating color signals of an object to be shot;

(b) detecting means for detecting a color temperature of a light illuminating said object and generating at least one detection signal in accordance with said detected color temperature;

(c) control means for controlling said generation means so as to adjust the colors of a picture in accordance with said detection signal;

(d) memory means having automatic and memory control modes, said memory means transmitting said detection signal to said control means in said automatic control mode, said memory means storing said detection signal and outputting said stored detection signal to said control means in said memory control mode;

(e) selection means adapted to select one of said automatic and memory control modes of said memory means;

(f) power source means for energizing said camera and deenergizing said camera; and

(g) changing means responsive to said deenergizing of said camera by said power source means to change over said selection means to the first control mode when the second control mode has been selected.

4,574,304

AUDIENCE RATING MEASURING SYSTEM FOR TELEVISION AND VIDEO TAPE RECORDER

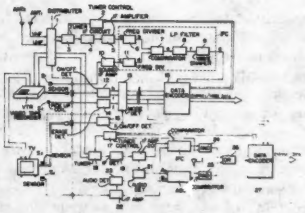
Fumio Watanabe, Zama, and Yoshikazu Itoh, Kunitachi, both of Japan, assignors to Video Research Limited, Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,404

Claims priority, application Japan, Apr. 22, 1983, 58-71221; Jun. 17, 1983, 58-107896; Jun. 17, 1983, 58-107897

Int. Cl.⁴ H04N *17/04, 17/06*

U.S. Cl. 358—84 **6 Claims**



1. An audience rating measuring system for a television receiver adapted for receiving a plurality of channels and a video tape recorder having a plurality of operation modes connected thereto and adapted for selectively receiving said channels, said system comprising:

video tape recorder channel discrimination means for detecting the channels received by the video tape recorder;

video tape recorder operation mode discrimination means for detecting the operation modes of the video tape recorder; and

television channel discrimination means for detecting the channels received by the television receiver;

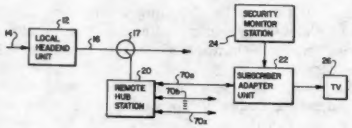
said audience measuring system detecting the modes of the video tape recorder and the television receiver when used in combination.

4,574,305

REMOTE HUB TELEVISION AND SECURITY SYSTEMS

John G. Campbell, Irving, and Carl F. Schoeneberger, Carrollton, both of Tex., assignors to Tocum, Incorporated, Irving, Tex.

Filed Aug. 11, 1983, Ser. No. 522,908
Int. Cl.⁴ H04N 7/10
U.S. Cl. 358—86 **5 Claims**



1. In a data communication system in which data, including television signals, are transmitted from a central station to a plurality of remote user stations at different levels of service, and data including security information are transmitted from the remote user stations to the central station, the combination comprising:

(a) a remote hub processing station in communication with and located remote from the central station and the plurality of user stations, having:

(1) first splitter means for splitting the television signals transmitted by the central station into a plurality of television signals, one for each level of service provided to the remote user stations,

(2) a plurality of second splitter means in communication with said first splitter means, each second splitter means receiving a portion of one of said plurality of television signals and splitting said one signal into a plurality of user television signals for said remote user stations,

(3) a plurality of filter means, each filter means receiving one of said plurality of television signals and transmitting to one of said second splitter means said portion of one of the television signals representative of one level of service provided to the plurality of user stations,

(4) a plurality of data communication links, each extending from one of said second splitter means to one of the remote user stations,

(5) security data separator means connected to each of said plurality of data communication links for receiving security signals from said remote user stations and transmitting the security signals on a common security bus,

(6) security logic means in communication with said security bus for generating security data representative of the security signals from the remote user stations, and

(7) transmitter means in communication with said security logic means for transmitting the security data to the central station, and

(b) a plurality of adapter means in communication with said remote hub processing station, each adapter means being located at one of said remote user stations, and having:

(1) frequency separator means in communication with one of said data communication links for receiving the user television signals from one of said second splitter means and for transmitting the security signals to said security data separator means,

(2) a plurality of security monitoring devices, each having an alarm means for selectively generating an alarm signal representative of the status of the security monitoring device,

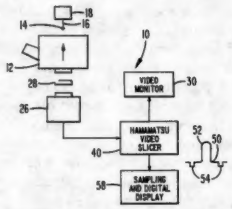
(3) security arming means connected to each of said security monitoring devices for receiving said alarm signals and generating the security signals representative of the status of the security monitoring devices to the frequency separator means.

4,574,306

APPARATUS AND METHOD FOR AUTOMATICALLY MEASURING THE SHOE-LENGTH OF A VIDEO DISC STYLUS

John A. van Raalte, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 27, 1984, Ser. No. 574,462
Int. Cl.⁴ H04N 7/18
U.S. Cl. 358—107 **9 Claims**



1. Apparatus for automatically measuring the length of a body having microscopic dimensions comprising:

(a) an optical microscope capable of being focused on said body and forming an optical image only thereof;

(b) a video camera coupled to said microscope and arranged to form first video signals representative of said optical image;

(c) video slicer means responsive to said first video signals for generating second video signals representative of the brightness of said optical image only along a particular sampling line; and

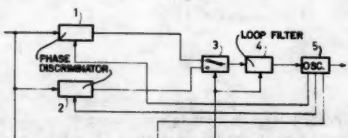
(d) sampling and display means responsive to said second video signal for automatically determining a value representative of the length of said body along said sampling line and generating a third-signal representative of said determined value in predetermined units of length.

4,574,307

LINE SYNCHRONIZING CIRCUIT FOR A PICTURE DISPLAY DEVICE

Antonius H. H. J. Nillesen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1983, Ser. No. 529,893
Claims priority, application Netherlands, Sep. 14, 1982, 8203556
Int. Cl.⁴ H03L 7/00; H04N 5/04
U.S. Cl. 358—158 **9 Claims**



1. A line synchronizing circuit for a picture display device, comprising a control loop for controlling the frequency and/or

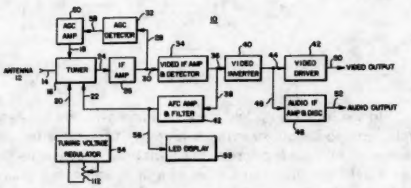
the phase of a line oscillator, having means for applying an incoming pulse-shaped line synchronizing signal and a reference signal generated by the oscillator to a phase discriminator circuit for determining the phase difference between the signals applied thereto and having a loop filter for smoothing the phase discriminator output signal and for applying the smoothed phase discriminator output signal as a control signal, to the oscillator for the control thereof, said control loop being such that during operation, in a target state thereof, the center instant of an edge of the reference signal substantially coincides with the center instant between a leading edge and the subsequent trailing edge of a line synchronizing pulse, the line synchronizing circuit also comprising a coincidence detector for detecting a phase difference between an incoming line synchronizing pulse and an oscillator pulse of said line oscillator which difference is less than a predetermined value and for changing-over the mode of operation of the control loop, characterized in that said line synchronizing circuit further comprises means coupled to said phase discriminator circuit for changing the operation thereof in response to said coincidence detector, whereby, when coincidence is detected, said phase discriminator circuit controls said line oscillator so that the center instant of the leading edge of an incoming line synchronizing pulse substantially coincides with the center instant between said edge of the reference signal and a first preceding edge thereof.

4,574,308

FM VIDEO RECEIVER

Galen R. Gibson, Bartlesville, and Ralph E. Anstaett, Jr., Tulsa, both of Okla., assignors to Dell-Star Corporation, Tulsa, Okla.

Filed Apr. 20, 1984, Ser. No. 602,475
Int. Cl.[4] H04N 5/44
U.S. Cl. 358—188 **2 Claims**



1. An FM video receiver supplied with a plurality of frequency modulated (FM) composite video signals by an antenna comprising:

an ultra high frequency tuner having an antenna signal input, an automatic gain control (AGC) signal input and an automatic frequency control (AFC) signal input, said antenna signal input capable of receiving said plurality of FM composite video signals and said tuner including means for selecting one of said plurality of FM composite video signals, said tuner including an amplifying means for amplifying said selected FM composite video signal, said tuner including means for generating an intermediate frequency composite signal carrying the same intelligence as the amplified selected FM composite video signal at a frequency lower than said selected FM composite video signal, said tuner applying said intermediate frequency composite video signal on a corresponding output;

an intermediate frequency amplifier having an input coupled to said output of said tuner, said intermediate frequency amplifier amplifying said intermediate frequency composite signal and applying the amplified intermediate frequency composite signal to a corresponding output;

means for limiting and discriminating said amplified intermediate frequency composite signal, said means for limiting and discriminating tuned to the video portion of said amplified intermediate frequency composite signal and generating an amplitude modulated video signal corresponding to the amplitude of the frequency variation of the video portion of said amplified intermediate frequency composite signal, said amplitude modulated video signal being applied to an output of said means for limiting and discriminating;

a video driver coupled to said output of said means for limiting and discriminating, said video driver amplifying said amplitude modulated video signal to generate a line level video signal at a corresponding output;

an automatic gain control (AGC) means coupled said output of said intermediate frequency amplifier, said AGC means providing a feedback signal to said AGC signal input of said tuner to affect the tuner amplifying means and to stabilize said intermediate frequency composite signal;

an automatic frequency control (AFC) means coupled to said output of said means for limiting and discriminating, said AFC means providing a feedback signal to said AFC signal input of said tuner to affect said means for selecting one of said plurality of FM composite video signals; and

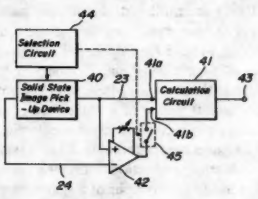
an audio intermediate frequency amplifier coupled to said output of said means for limiting and discriminating, said audio amplifier including means for separating the audio portion from said amplitude modulated video signal, and including an audio limiter and discriminator means, said audio amplifier generating an amplitude modulated audio signal corresponding to the amplitude of the frequency variation of the audio portion of said amplified intermediate frequency composite signal and applying said amplitude modulated audio signal to a corresponding output.

4,574,309

SOLID STATE IMAGE PICK-UP DEVICE

Yasuo Arisawa, Matsumoto; Yoshimasa Kusazaki, Nagano; Hidetoshi Yamada, Tokyo; Akira Watanabe, Fuchu, and Yutaka Yunoki, Kunitachi, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,033
Claims priority, application Japan, Sep. 9, 1982, 57-157289
Int. Cl.[4] H04N 3/12, 5/14
U.S. Cl. 358—212 **13 Claims**



1. A solid state image pick-up device comprising

means having a number of picture elements arranged in a matrix form, each picture element including at least one MOS transistor and a photodiode;

horizontal scanning means connected to said picture elements for scanning horizontally the picture elements at a given horizontal scanning period;

vertical scanning means connected to said picture elements for scanning the picture elements at a given vertical scanning period;

signal reading-out means including first and second signal read-out lines selectively connected to the picture elements under the control of said horizontal and vertical scanning means in such a manner that signal charges stored in the photodiodes are read-out twice within a frame period to perform a shutter function having a variable shutter open time;

contour enhancing means for enhancing a contour of an image in a vertical direction by reading-out signal charges stored in two vertically adjacent photodiodes simulta-

neously, while said shutter open time is fixed to the frame period, to effect a contour enhancement function; and

selection means for selecting one of said shutter function and contour enhancement function at will.

4,574,310

ONE-DIMENSIONAL SEMICONDUCTOR IMAGING DEVICE

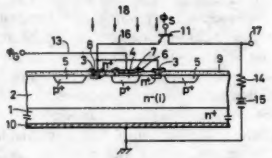
Jun-ichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi, and Takashige Tamamushi, Miyagi, both of Japan, assignors to Jun-ichi Nishizawa, Miyagi, Japan

Filed Dec. 13, 1983, Ser. No. 561,110

Claims priority, application Japan, Dec. 13, 1982, 57-218586

Int. Cl.[4] H04N *3/12*

U.S. Cl. 358—212 **3 Claims**



1. A semiconductor device comprising a linear array of pixels each comprising a static induction transistor comprising:

a pair of principal electrode regions comprising two semiconductor regions of one conduction type arranged facing each other through a channel region made of high resistivity semiconductor material;

first and second gate regions comprising semiconductor regions of the other conduction type formed in contact with said channel region for to controlling current flow between said two principal electrode regions; and

a transparent electrode formed on at least one part of said first gate electrode through a capacitor, carriers generated by light excitation being accumulated in said first gate region so as to effect control over current flowing between said two principal electrodes, one of said two principal electrode regions being common to all pixels and being connected to a video signal output terminal through a switch, said output terminal being connected to one terminal of a video power supply through a load resistance, the other principal electrode region and said second gate region being common to all pixels, said first gate region of each static induction transistor being independently connected to a different output of a scanning circuit through a capacitor.

4,574,311

RANDOM ARRAY SENSING DEVICES

Howard L. Resnikoff, Boston; Tomaso Poggio, Wellesley, and Karl Sims, Boston, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Apr. 4, 1985, Ser. No. 720,017

Int. Cl.[4] H04N *5/22*

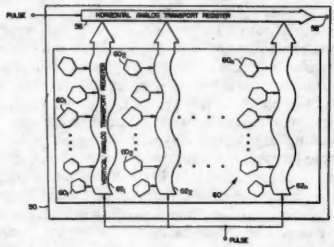
U.S. Cl. 358—213 **20 Claims**

1. A sensing device for generating an output signal corresponding to an input signal, comprising

a substrate;

an array of sensor elements for receiving said input signal, said sensor elements having their barycenters distributed on the surface of said substrate in a random, non-periodic pattern; and

transfer members located on the surface of said substrate and interposed between said sensor elements, said transfer



members being coupled to said sensor elements for generating said output signal.

4,574,312

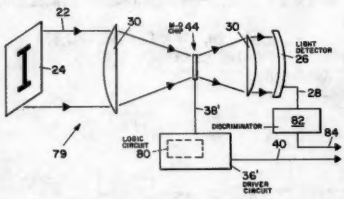
MAGNETO-OPTIC IMAGE SCANNING DETECTOR

Robert H. Anderson, Long Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 5, 1982, Ser. No. 375,329

Int. Cl.[4] H04N *3/10*; G02F *1/09*

U.S. Cl. 358—213 **8 Claims**



1. In a solid state optical image scanner wherein a magneto-optic composite chip having a plurality of areas alterable to pass or block light is disposed in a light beam between an image and a light detector and driven as a light valve in a scanning pattern both to pass light through selected areas as a desired light signal which generates a corresponding electrical signal of interest, and to block light through other selected areas that continue to pass constant background or noise light, the improvement to increase the light signal-to-background light noise ratio comprising:

(a) altering each area between the passing and blocking states to pass light at a selected area at a pre-determined frequency thereby generating a pulsating light signal portion;

(b) detecting the pulsating light signal portion and the constant background steady light portion; and,

(c) sensing the pulsating light signal portion and generating a corresponding electrical output signal of interest as a function thereof representative of the selected area.

4,574,313

CASCADED CCD SHIFT REGISTERS HAVING DIFFERENT NUMBERS OF CLOCKING PHASES

Donald F. Battson, Landisville, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 12, 1984, Ser. No. 680,847

Int. Cl.[4] H04N *3/15*

U.S. Cl. 358—213 **3 Claims**

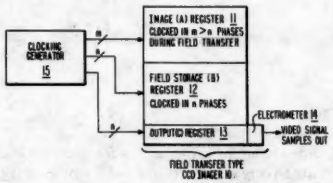
1. In Combination:

a first CCD shift register comprising a charge transfer channel

with input and output ends and a plurality of gate electrodes crossing over said charge transfer channel, said gate electrodes consecutively ordinally numbered first through m^{th} within consecutive cycles of m successive gate electrodes, from input to output ends of the charge transfer channel of said first CCD shift register, m being a positive integer greater than another positive integer n;

a second CCD shift register comprising a charge transfer channel with input and output ends and a plurality of gate electrodes crossing over said charge transfer channel, said gate electrodes consecutively ordinally numbered first through n^{th} within consecutive cycles of n successive gate electrodes, from input to output ends of the charge transfer channel of said second CCD shift register;

a connection of the output end of the charge transfer channel


CLOCKING GENERATOR 15
IMAGE (A) REGISTER 11 CLOCKED IN m >= PHASES DURING FIELD TRANSFER
FIELD STORAGE (B) REGISTER 12 CLOCKED IN n PHASES
OUTPUT(C) REGISTER 13
ELECTROMETER 14
VIDEO SIGNAL SAMPLES OUT
FIELD TRANSFER TYPE CCD IMAGER 10

of said first CCD shift register to the input end of the charge transfer channel of said CCD shift register; and

means for generating first and second clocking signals of the same periodicity, said first clocking signal having m phases ordinally numbered first through m^{th} respectively applied to gate electrodes of said first CCD register having the same ordinal numbering as the phase so applied, said second clocking signal having n phases ordinally numbered first through n^{th} respectively applied to gate electrodes of said second CCD register having the same ordinal numbering as the phase so applied, selected phases of said first and second clocking voltages being arranged to overlap in time in such phasing as to avoid merger of successive charge packets at said connection of the output end of the charge transfer channel of said first CCD shift register to the input end of the charge transfer channel of said second shift register.

4,574,314

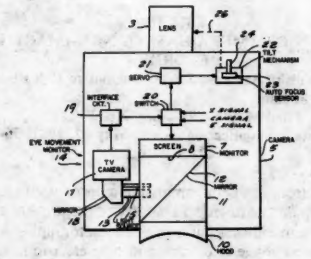
CAMERA AUTOFOCUS TECHNIQUE

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 383,282, May 28, 1982, abandoned. This application Mar. 28, 1984, Ser. No. 594,221

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **10 Claims**



1. An autofocus system for use on a camera having a lens, said system comprising:

eye movement monitoring means for detecting the rotational eye position of a cameraman as he views a certain scene to generate a signal representative of such eye position;

autofocus means coupled to said lens for suitably focusing the lens;

means responsive to said eye-position-representative signal for aiming said autofocus means in the direction looked at by the cameraman.

4,574,315

CIRCUIT FOR DRIVING DISPLAY APPARATUS

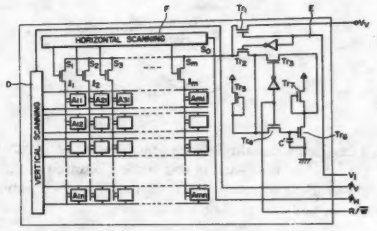
Masahiro Yoshimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,472

Claims priority, application Japan, May 11, 1983, 58-82922

Int. Cl.[4] H04N *5/66*

U.S. Cl. 358—241 **11 Claims**



1. A display circuit connected to receive a video signal, comprising:

a plurality of picture elements for displaying an image, each of said plurality of picture elements including:

a display element; and

a drive circuit, operatively connected to said display element, for driving said display element based on a drive voltage corresponding to the video signal, said drive circuit including a data holding element, a data writing element for writing the drive voltage corresponding to the video signal into said data holding element, and a data reading element for reading the drive voltage from said data holding element; and

a data regenerative circuit, operatively connected to said drive circuit of each of said picture elements, for receiving the drive voltages read from said respective drive circuits of said picture elements, for regenerating the drive voltages, and for providing the regenerated drive voltages for rewriting in said respective drive circuits by said data writing element.

4,574,316

DOCUMENT SCANNERS

Hugh Wilman, 76 Mount Grace Rd., Potters Bar, Hertfordshire, and James Brotton, 1 Moss Dr., Haslingfield, Cambridgeshire, both of England

Filed Nov. 4, 1983, Ser. No. 549,198

Claims priority, application United Kingdom, Nov. 5, 1982, 8231677

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 **9 Claims**

1. A document scanner for scanning a page of a book comprising:

i. a housing movable between at least first and second positions having at least one flat face containing a window through which light from a document to be copied can pass,

ii. a scanner within the housing adapted to scan an image of the document to generate an electrical video signal corresponding to the information carried by the document,

iii. means for supporting a document such as a book face

upwards so that, in the first position of the housing, the document book can be moved into contact with the window,

iv. a pivoting joint between the housing and a support therefore to permit rotation of the housing into the second position in which the window is unobstructed,

v. a carrier mounted relative to the housing and with which the window is aligned in said second position of the housing to allow an image of a document such as a film on the carrier to be formed on the scanner.

4,574,317

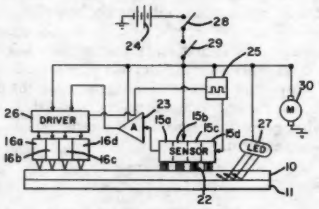
HAND SCANNABLE PORTABLE COPIER AND METHOD

Wayne Scheible, 9 Fencewood La., Hamlin, N.Y. 14464

Filed Dec. 12, 1983, Ser. No. 560,469

Int. Cl.[4] H04N *1/04, 1/10, 1/23*

U.S. Cl. 358—285 **9 Claims**



1. A hand held copier, completely solid state, combined scanner and printer comprising:

a miniature light source,

an optoelectric sensor including a solid state miniature linear array and optical focusing means,

a solid state miniature print head array,

said light source, sensor, and print head all being fixedly mounted on the same side of a support in spaced apart relationship to concurrently scan and print out the scanned image in coplanar relationship but at laterally spaced apart positions,

whereby the manually controlled positioning and scanning of a document to be copied enables the concurrent scanning and printing of the image to be copied at laterally spaced apart positions as the original document is traversed by the copier.

4,574,318

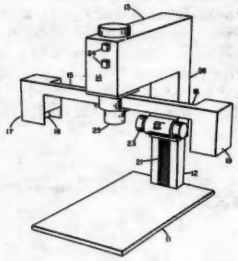
LIGHT ARRANGEMENT FOR SCANNER-DIGITIZER

Douglas C. Dayton, Cambridge; Clifford E. LaCount, Townsend, and Burton G. McConchie, Reading, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 30, 1983, Ser. No. 537,612

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 **14 Claims**



1. A video scanning arrangement for scanning and digitizing documents having alphanumeric and/or other image information thereon, and comprising:

a tablet on which a document to be scanned and digitized is placed,

a support member having a first end attached to said tablet,

an arm member having a first end movably attached to said support member so that said arm member can move along said support member to be at varying distances from said tablet,

a scanner attached to a second end of said arm member, said scanner being actuable to scan a document on said tablet for the creation of a digital representation of said document,

at least one light arm, with each light arm having a first end pivotally attached to said arm member, and

a light source attached to each light arm, with each light arm normally being folded against said arm member for storage when said video scanning arrangement is not in use, and each light arm being extendable from said arm member when said video scanning arrangement is in use to move said light source thereon pivotally outward to a fixed position relative to the scanner, to provide uniform illumination of said document.

4,574,319

ELECTRONIC CAMERA HAVING NON-IMAGE DATA RECORDER

Masahiro Konishi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed May 3, 1982, Ser. No. 374,171

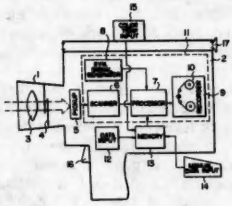
Claims priority, application Japan, May 12, 1981, 56-71144

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **28 Claims**

1. An electronic camera comprising a photographic lens, an image pickup device having a plurality of picture elements for receiving image information from said photographic lens and converting said image information into an electric image data output signal, and a mechanism for recording said image data output signal from said image pickup device on a recording medium, characterized in that said camera is provided with means for recording data other than said image information on the same recording medium as said recording medium on

which said image information is recorded, said data other than said image information comprising defective picture element



address data for indicating the position of any defective picture elements in said image pickup device.

4,574,320

DICTATING MACHINE HAVING A REVISING FUNCTION

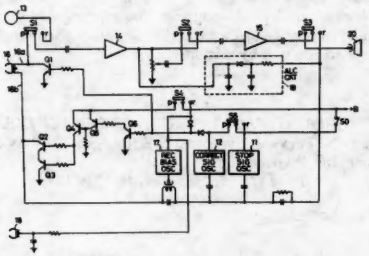
Yuji Urayama, Maebashi, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed Dec. 27, 1983, Ser. No. 565,630

Claims priority, application Japan, Dec. 28, 1982, 57-200363[U]

Int. Cl.⁴ G11B *15/12*

U.S. Cl. 360—62 **7 Claims**



1. A dictating machine having a revising function for carrying out recording and reproduction of messages with respect to a magnetic tape having at least first and second tracks, said first track being used for recording a message, said second track being used for recording a new content which is recorded when revising the message, said dictating machine comprising:

a power source;

recording signal supplying means for supplying a signal indicative of the message or the new content which is to be recorded;

recording and reproducing means for recording the output signal of said recording signal supplying means on the first or second track of said magnetic tape in a recording state thereof and for reproducing the recorded signal from the first or second track of said magnetic tape in a reproducing state thereof, said recording and reproducing means comprising a single magnetic head;

erasing means for erasing the recorded signal on the first or second track of said magnetic tape in an operating state thereof;

bias signal generating means for supplying a bias signal to said recording and reproducing means in an operating state thereof;

stop signal generating means for supplying a stop signal to said recording and reproducing means in an operating state thereof, said stop signal having a first frequency and indicating an end of the message; and

correction signal generating means for supplying a correction signal to said recording and reproducing means in an operating state thereof, said correction signal having a second frequency and indicating a part in the message where a correction or addition of a content is required,

said correction signal generating means supplying the correction signal to said single magnetic head during non-operating states of said erasing means and said bias signal generating means so that said single magnetic head records the correction signal over a pre-recorded signal on the first track by superimposing without erasing the pre-recorded signal,

said single magnetic head recording and reproducing the signal indicative of the message on and from the first track in a first longitudinal direction of said magnetic tape, said single magnetic head recording and reproducing the signal indicative of the new content on and from the second track in a second longitudinal direction of said magnetic tape, said second longitudinal direction being opposite to said first longitudinal direction,

the recording and reproduction of the signal indicative of the new content on and from the second track in said second longitudinal direction being realized by reversing the side of the magnetic tape.

4,574,321

AUTOMATIC BACKSPACE DEVICE FOR A TAPE RECORDER

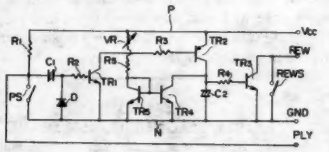
Katsumi Kanayama, Tokyo, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Nov. 22, 1982, Ser. No. 443,220

Claims priority, application Japan, Nov. 26, 1981, 56-175983[U]; Nov. 26, 1981, 56-175984[U]

Int. Cl.⁴ G11B *15/48*

U.S. Cl. 360—74.1 **5 Claims**

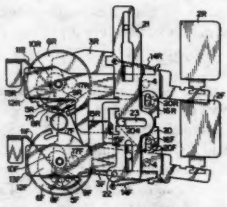


3. An automatic backspace device characterized by a reproduction operating switch for actuating a magnetic tape; producing means for producing a constant discharge current in response to operation of said switch, a time constant circuit having a time constant; a first transistor which is turned on in response to current from said producing means, a capacitor, means for supplying electrical current to said capacitor during a time period when said first transistor is turned on; a current mirror circuit having second and third transistors; means connected to said second transistor for forming a predetermined electrical current; and the third transistor being connected in parallel with said capacitor for discharging said capacitor with said predetermined electrical current; and a fourth transistor to be turned on in response to electrical current discharged by said capacitor for producing a rewind signal and rewinding said magnetic tape while said fourth transistor is turned on.

4,574,322
CHANNEL CHANGING MECHANISM OF A TAPE PLAYER

Yuji Teraguchi, and Sadayoshi Endo, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,948
Claims priority, application Japan, Feb. 15, 1983, 58-22043
Int. Cl.[4] G11B *15/44, 21/08*
U.S. Cl. 360—74.1 7 Claims



1. A channel changing mechanism of a tape player which comprises:

forward-drive means for setting the tape player in its fast-forwarding drive mode;

reverse-drive means for setting the tape player in its rewinding drive mode;

forward-drive and reverse-drive electromagnetic plungers for actuating said forward-drive means and reverse-drive means, respectively;

an off plate responsive to a head shift mechanism of the tape player and to one of said electromagnetic plungers and taking different positions between the stop mode and the play mode of the tape player;

first drive gear continuously rotated by a drive motor of the tape player;

a change gear having a tooth train engageable with said first drive gear and a pair of cut-off partly breaking said tooth train and disengageable with said first drive gear;

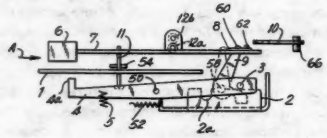
a change link plate reciprocal responsively to rotation of said change gear for switching the tape player from a forward-drive mode to a reverse-drive mode or vice versa; and

a change-off plate for locking said change gear at a position disengageable with said first drive gear, and responsive to said off plate when the off plate is in a position corresponding to the play mode of the tape player.

4,574,323
FLEXIBLE MAGNETIC DISK DRIVE

Masao Momose, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,201
Claims priority, application Japan, Oct. 20, 1981, 56-167482
Int. Cl.[4] G11B *17/04, 5/82*
U.S. Cl. 360—99 17 Claims



1. A flexible magnetic disk drive including a disk ejection mechanism comprising:

an ejector having a portion for contact by a magnetic disk inserted in said ejection mechanism, said ejector being subject to translation by force of said inserted disk pushing in a first direction on said portion for contact, and a first engagement portion;

spring means for opposing said translation of said ejector, said spring means tending to return said ejector in a second direction opposite to said first direction to a non-translated position;

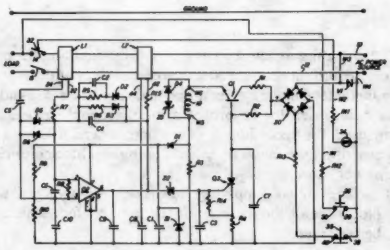
a lock lever mounted for pivoting about an axis and including a second engagement portion, said first engagement portion of said ejector and said second engagement portion of said lock lever being subject to interengagement upon translation of said ejector to a selected position by said disk, said lock lever pivoting in one direction during said interengagement, said lock lever having a blocking portion, said blocking portion being for blocking removal of said disk when said disk is in said drive, said blocking portion being coupled to said lock lever so that said blocking portion is moved into a blocking position by said pivoting in said one direction;

a slide lever, and an ejection transmission lever, said ejection transmission lever being pivotally mounted in said drive and configured so that said ejection transmission lever is subject to pivoting upon motion of said slide lever in an ejecting direction, said ejection transmission lever being pivoted into contact with said second engagement portion of said lock lever when said slide lever moves in said ejecting direction, contact of said ejection transmission lever and said second engagement portion causing disengaging of said first and second engaging portions, and pivoting of said lock lever about said axis upon said disengagement, said blocking portion of said lock lever moving from said blocking position, said spring means moving said ejector in said second direction, said ejector portion for contact by said magnetic disk causing said disk to be ejected as said ejector is forced to return to said non-translated position by said spring means.

4,574,324
GROUND FAULT CIRCUIT INTERRUPTER

Thomas N. Packard, Syracuse, N.Y., assignor to Pass & Seymour, Inc., Solvay, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,153
Int. Cl.[4] H02H *3/33*
U.S. Cl. 361—46 28 Claims



1. A ground fault circuit interrupter for opening a power distribution line including hot and neutral conductors and extending between an electrical power source and a load, said interrupter comprising:

(a) a relay having at least one member interposed in said distribution line and movable between open and closed positions with respect thereto, means biasing said member to said open position, and a coil operable to move said member to said closed position in response to current flow through said coil;

(b) at least one sensing means adapted to generate a signal in response to an imbalance of current flow in the conductors of said distribution line, indicating a ground fault condition;

(c) a power supply line communicating with said power distribution line to provide current to said coil to maintain said member in said closed position;

(d) switching means electrically connected to said coil and operable in response to said signal to remove current from said coil, thereby permitting said member to move to said normally open position and interrupting the circuit through said distribution line between said source and said load; and

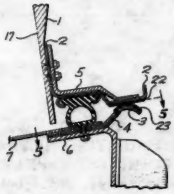
(e) circuit means so arranged with respect to said coil, said sensing means and said switching means that current is removed from said coil in the event of said ground fault condition when a short circuit across said switching means is present.

4,574,325

LIGHTNING PROTECTION ELECTRICAL CIRCUIT PATH FOR COUPLING BETWEEN AIRCRAFT STRUCTURES

Raymond G. C. Holton, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 9, 1984, Ser. No. 578,396
Int. Cl.[4] H05F 3/02
U.S. Cl. 361—218 **5 Claims**



1. A lightning protection electrical current path for coupling between aircraft structures comprising:

a first aircraft structure;

a second aircraft structure;

a grounding clip electrically conductively connected to said first aircraft structure;

a grounding strip electrically conductively connected to said second aircraft structure;

said grounding clip and said grounding strip comprising stainless steel; and,

said grounding strip and said grounding clip having tungsten carbide coated interfacing and abutting surface portions.

4,574,326

ELECTRICAL CHARGING APPARATUS FOR ELECTROPHOTOGRAPHY

Hisashi Myochin, Toyohashi, and Kuniki Seino, Aichi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

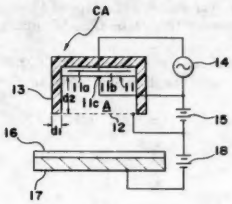
Filed Mar. 6, 1985, Ser. No. 708,945
Claims priority, application Japan, Mar. 9, 1984, 59-34727[U]
Int. Cl.[4] H05F 3/06
U.S. Cl. 361—229 **7 Claims**

1. An electrical charging apparatus which comprises;

a charging panel including a first electrode formed by a metallic plate, a heat-resistant electrically insulative member for covering a surface of said first electrode, and a second electrode in the form of a thin wire fixed to a surface of said heat-resistant electrically insulative member so as to face said first electrode through said heat-resistant electrically insulative member,

a power source for applying a high voltage AC current between said first electrode and said second electrode,

a third electrode in the form of a mesh provided to confront said second electrode, and



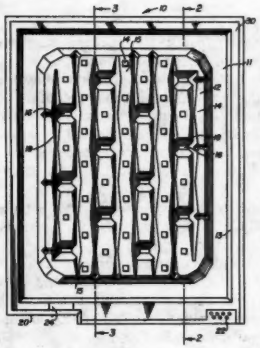
a support member for supporting said third electrode and also for surrounding three sides of said charging panel.

4,574,327

CAPACITIVE TRANSDUCER

Leslie B. Wilner, Palo Alto, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed May 18, 1984, Ser. No. 611,765
Int. Cl.[4] H01G 7/00; G01L 1/22
U.S. Cl. 361—283 **12 Claims**



1. A plate for use as the movable capacitor plate in a capacitive sensing apparatus, characterized by

(a) said plate comprised of monocrystalline silicon;

(b) a rim forming the periphery of said plate;

(c) a central seismic mass on said plate, and spaced on each side edge from said rim;

(d) a membrane spring surrounding said seismic mass and forming the connection thereof on all sides to said rim;

(e) said seismic mass being supported on said membrane for movement in a plane normal to the plane of said plate, when mounted in a capacitive sensing apparatus;

(f) at least one hole formed in said seismic mass for forming fluid communication between each side of said mass when mounted in a capacitive sensing apparatus;

(g) a plurality of grooves formed in one face of said plate;

(h) said grooves extending in said face from said hole to a point spaced from said hole;

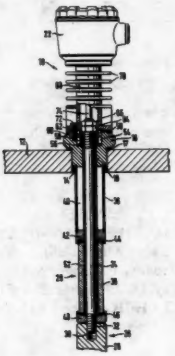
(i) said grooves being of gradually decreasing cross section in direct relationship to the distance away from said hole; and

(j) electrical contact means on said plate for transmitting the measured stimuli of said plate when mounted in a capacitive sensing apparatus.

4,574,328
SENSOR FOR CAPACITIVELY MEASURING THE LEVEL OF MATERIAL IN A CONTAINER

Winfried Maier, Maulburg, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 592,332
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 8216324[U]
Int. Cl.[4] G01F *23/26;* H01G *5/28*
U.S. Cl. 361—284 13 Claims



1. A sensor for capacitively measuring the level of material in a container, said sensor comrising:

an elongated electrically conductive sensor electrode extending through an opening in a wall of said container into said container, said sensor electrode having a first part and a second part and being connected to mesuring circuitry responding to the capacitance between said sensor electrode and a counter-electrode, which capacitance depends on the level of material in said container;

mounting means for mounting said sensor electrode in an electrically insulating and pressure-tight manner in said container wall opening;

a metallic tubular member connected to said mounting means in a moisture-proof manner and surrounding said first part of said sensor electrode to define a space beween said tubular member and said sensor electrode whereby said tubular member and said sensor electrode are electrically insulated from one another, said tubular member having an inner end remote from said mounting means, said first part of said sensor electrode which is surrounded by said tubular member being inactive for capacitive level measurement;

means for sealing said inner end of said tubular member so as to prevent entry of moisture into said space between said tubular member and said sensor electrode;

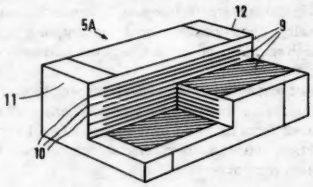
said second part of said sensor electrode extending beyond said sealing means and defining an active part of said sensor electrode for capacitive level measurement.

4,574,329
MULTILAYER CERAMIC CAPACITOR

Antonius J. H. Eijkelenkamp; Gijsbertus de With, and Willem R. de Wild, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,220
Claims priority, application Netherlands, Oct. 7, 1983, 8303448; Jun. 13, 1984, 8401865
Int. Cl.[4] H01G *1/01*
U.S. Cl. 361—321 20 Claims

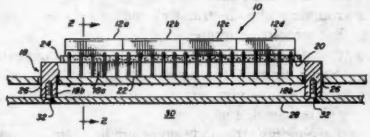
1. A multilayer capacitor composed of alternate dielectric layers of dielectric oxidic ceramic material and of an electrode material, and formed into a compact unit by the application of heat and pressure, characterized in that the capacitor is formed of a compact unit through a thermal treatment by simultaneously applying pressure in a direction transverse to the planes of said layers, and has layers of electrode material consisting of a mixture of 7 to 60% by volume of metal having a high conductivity and of 40 to 93% by volume of particles of a ceramic material having a sintering temperature which is higher than the sintering temperature of the oxidic ceramic material of the dielectric layers.



4,574,330
HEAT SINK FOR DISSIPATING HEAT GENERATED BY ELECTRONIC DISPLAYS

Marvin M. Cohen, and Francis L. Payne, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Continuation of Ser. No. 450,983, Dec. 20, 1982, abandoned.
This application Aug. 5, 1985, Ser. No. 763,072
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 5 Claims



1. An article for dissipating heat comprising in combination a heat generating alphanumeric display and an electronic circuit board, said alphanumeric display being electrically connected to said circuit board;

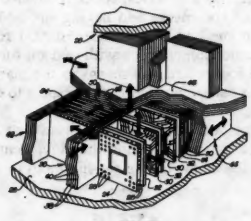
a solid heat sink thermally coupled to a portion of the underside of said alphanumeric display, said solid heat sink having a surface contact portion smaller than the width of the underside of said alphanumeric display and in thermal contact with said portion of the underside of said alphanumeric display, said surface contact portion of said solid heat sink being centrally disposed with respect to the width of the alphanumeric display;

a heat dissipating plate spaced from said circuit board, at least one solid extension portion of said solid heat sink extending through said circuit board and in thermal and mechanical contact with said dissipating plate, a second portion of said heat sink contiguous to said solid extension portion located on a non-conductive surface portion of said circuit board, said heat sink transferring heat generated by said alphanumeric display directly to said dissipating plate.

4,574,331
MULTI-ELEMENT CIRCUIT CONSTRUCTION

Robert Smolley, Portuguese Bend, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 31, 1983, Ser. No. 499,136
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—393 5 Claims



1. A three-dimensional integrated-circuit packaging construction, comprising:

a plurality of integrated-circuit (IC) chip packages arrayed in parallel relationship with each other, each of said IC chip packages having input/output contact areas located on various faces of the package, and having edge contact areas;

chip package interconnection means disposed between each adjacent pair of said IC chip packages, to establish desired electrical connections between the two, said IC chip packages and said chip package interconnection means together forming a first IC chip module;

at least one additional IC chip module of similar construction to said first IC chip module;

transverse chip module interconnection means disposed between said first and additional IC chip modules, and between any other adjacent pairs of IC chip modules, to establish selected connections between side edge contact areas of two modules, said transversely interconnected IC chip modules forming a first IC chip module layer;

at least one additional IC chip module layer of similar construction to said first IC chip module layer; and

chip module layer interconnection means disposed between said first and additional IC chip module layers, and between any other adjacent pairs of IC chip module layers, to establish selected connections between said IC chip module layers;

whereby interconnections between IC chip packages may be made in any of three dimensions, and current path lengths within the interconnections are minimized.

4,574,332
CAGE APPARATUS FOR PRINTED CIRCUIT BOARDS AND METHOD FOR PREVENTING SHARP SPIKES IN THE SIGNAL APPLIED TO SAID PRINTED CIRCUIT BOARDS

Anthony D. Calabro, UNITRACK Div., Calabro Industries, Inc., 1372 Enterprise Dr., West Chester, Pa. 19380

Filed Jun. 29, 1983, Ser. No. 508,827
Int. Cl.[4] H01R *23/68*
U.S. Cl. 361—413 1 Claim

1. A cage apparatus for receiving a plurality of printed circuit boards, each said printed circuit board being generally rectangular in configuration and including opposed top and bottom edges and a connector edge, said top and bottom edge being provided with electrically conductive strips attached thereto, said connector edge including a plurality of pin connector means for electrically joining each said circuit board to a multiple pin connector, said cage apparatus comprising:

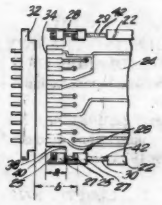
top and bottom supports disposed in spaced parallel relationship with the spacing therebetween being equal or slightly greater than the distance between the top and bottom edges of each said circuit board;

spaced apart end plates connected to and extending between said top and bottom supports;

a plurality of multiple pin connectors extending between and connected to said top and bottom supports, said multiple pin connectors being disposed in spaced parallel relationship to one another;

a pair of dielectric mounting guides for each said multiple pin connector, the dielectric mounting guides in each said pair being mounted respectively to said top and bottom supports such that each said dielectric mounting guide is aligned with but spaced from its associated multiple pin connector, the spacing between the dielectric mounting guides in each said pair corresponding to the distance between the top and bottom edges of each said circuit board each said dielectric mounting guide including a plurality of spring fingers for biasingly engaging the associated circuit board and guiding the circuit board toward the associated multiple pin connector;

a pair of electrically conductive mounting guides for each said multiple pin connector, the electrically conductive



mounting guides in each said pair being aligned collinearly respectively with the dielectric mounting guides and being disposed intermediate one said dielectric mounting guide and the associated multiple pin connector, each said electrically conductive mounting guide including a plurality of spring fingers for biasingly engaging the electrically conductive strips of said circuit board, said spring fingers of said electrically conductive mounting guide being spaced from the associated multiple pin connector such that the electrically conductive strips must engage the electrically conductive mounting guides prior to the insertion of the circuit board into the multiple pin connector,

means for providing an electrical signal to said multiple pin connectors; and

means for providing an electrical signal to said multiple pin connectors; and

means for providing a electrical potential across the electrically conductive mounting guides in each said pair, whereby the provision of the electrical potential across the mounting guides prior to insertion of each said circuit board into the corresponding multiple pin connector prevents sharp spikes in the electrical signal upon said insertion.

4,574,333
LOW DENSITY TANTALUM ANODE BODIES

William B. Snyder, Greenville, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

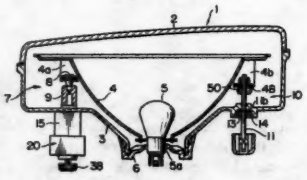
Filed Jun. 12, 1985, Ser. No. 743,959
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 1 Claim

1. A tantalum anode body formed of high surface area tantalum particles pressed to a density of from about 3 to 5 grams/cc about a tantalum riser wire having a coating of nickel of from about 500 Å to 5000 Å.

4,574,334
DEVICE FOR ADJUSTING THE INCLINATION OF THE LIGHT AXIS OF HEADLAMPS OF A MOTOR VEHICLE

Kenkichi Igura, Fujisawa, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,830
Claims priority, application Japan, Mar. 22, 1983, 58-39685[U]; Mar. 22, 1983, 58-39686[U]; Aug. 16, 1983, 58-126162[U]
Int. Cl.[4] F21V 3/18
U.S. Cl. 362—66 6 Claims



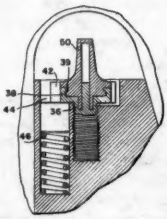
1. In a device for adjusting the inclination of a light axis of a headlamp by controlling a light axis changing mechanism which changes the light axis of a headlamp in relation to a car body, said light axis changing mechanism comprising:
- a mounting means arranged on a side of the headlamp;
- a ball joint for cooperating with the mounting means to achieve a ball socket joint; and
- a connector rod means one end of which is connected to the ball joint;

and said light axis adjusting device comprising:
- a casing;
- a motor arranged in the casing;
- a hollow gear means arranged to be rotatable in the casing;
- a speed reduction mechanism arranged in the casing and connected to the motor and the hollow gear means to reduce the output of the motor and transmit it to the hollow gear means;
- a sleeve inserted into the hollow gear means and moved linearly when the hollow gear means is rotated;
- a means for converting the rotation of the hollow gear means to a force which causes the sleeve to be moved linearly; and
- an adjusting rod means connected with an end of said connector rod means by a ball joint mechanism which is constructed by a spherical socket provided at the end of one of said rod means and having slit, and a ball means formed at the end of the other of said rod means and having projection engaged with said slit for coupling said spherical socket and ball means in the manner that both rod means can swing freely with respect to each other but rotate integrally;
- said adjusting rod means being reciprocated with the connector rod means, following the movement of the sleeve to adjust the inclination of the light axis of the headlamp.

4,574,335
LIGHTED GUN SIGHTS

Itzchak Frimer, Bnei Brak, Israel, assignor to Orlite Engineering Ltd., Zone A Nes Ziona, Israel

Continuation of Ser. No. 316,053, Oct. 28, 1981, abandoned. This application Sep. 12, 1984, Ser. No. 650,552
Claims priority, application Israel, Oct. 31, 1980, 61388
Int. Cl.[4] F41G 1/34
U.S. Cl. 362—84 7 Claims



1. Apparatus for assisting aiming of firearms in darkness comprising:
- a sight defining two spaced upstanding elements, each bearing at identical levels thereon one of a pair of light sources defining dots;
- a forward pointer having a longitudinal axis, said pointer comprising a base portion whose height is determined by rotatable threading thereof into a socket fixed on the firearm, and a top portion which is rotatably mounted with respect to said base portion and arranged for rotation about a rotation axis defined by the longitudinal axis of said forward pointer without changing the height thereof; and a third light source defining a dot associated with the top portion of said forward pointer of said firearm, said third light source arranged to be aligned along a line between said pair of light sources and aligned with a target when the firearm is aimed in darkness, whereby said third light source may be maintained in a rearward facing direction with respect to the firearm at any height thereof.

4,574,336
CORNICE LIGHTING FIXTURE FOR MASS TRANSIT VEHICLES

Liudas K. Mikalonis, Northville, Mich., assignor to Transmatic, Inc., Waterford, Mich.

Filed Mar. 27, 1984, Ser. No. 594,020
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—260 4 Claims

1. A cornice lighting fixture for mass transit vehicles, said fixture comprising:

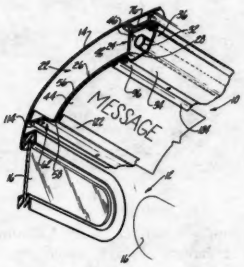
an elongated sheet-like unitary molded body including a

lamp panel defining one longitudinal margin of the fixture and a trim panel extending obliquely in a downward and outward direction from a corner-like juncture of one edge thereof with one edge of the lamp panel and defining the other longitudinal margin of the fixture,

said trim panel including a mounting flange extending along the other edge thereof,

said lamp panel including a vertical portion extending upwardly from said one edge thereof and including a horizontal portion extending inwardly from the vertical portion and terminating in a free edge, said lamp panel opening inwardly and downwardly and adapted to receive a fluorescent tube,

an extruded connector extending along said free edge and attached thereto, said connector having a horizontal portion overlapping said horizontal portion of the lamp panel to provide a double-wall mounting strip for connecting the fixture to the vehicle, said connector having a groove



therein extending along said free edge and opening downwardly,

an elongated lens cooperating with said lamp panel to enclose said fluorescent tube and having an upper edge interlocked in said groove and having a lower edge terminating adjacent said corner-like juncture and secured to said one edge of said trim panel outwardly of said corner-like juncture by a removable fastener,

first and second extruded retainer strips secured to said trim panels and extending longitudinally thereof in parallel spaced relation, each of said retainer strips having an overhanging lip extended along one edge thereof and spaced from the surface of said trim panel to define a retaining groove which opens toward the other retainer strip, said retaining grooves being adapted to receive the edges of an advertising card to retain it on said trim panel adjacent said lamp housing,

said first retainer strip being disposed outwardly of said lower edge of said lens.

4,574,337

UNDERWATER LIGHTS

Charles B. Poppenheimer, Pasadena, Calif., assignor to GTY Industries, Sun Valley, Calif.

Filed Feb. 10, 1984, Ser. No. 579,134
Int. Cl.⁴ F21V *31/00*
U.S. Cl. 362—267 **14 Claims**

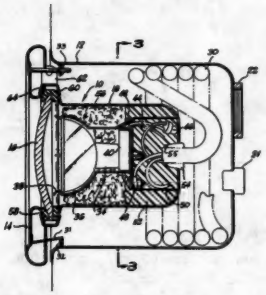
1. An underwater light, comprising

a thermally-conductive housing having a first opening;

a lens assembly sealably closing said first opening;

a heat conductive reflector within said housing directed toward said opening;

a lamp within said reflector; and



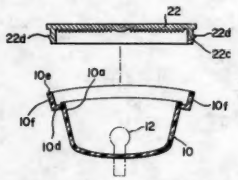
thermally-conductive elements comprising metallic wool material extending between said reflector and said housing and in thermal contact therewith.

4,574,338

LIGHT ASSEMBLY WITH FLEXED THERMOPLASTIC FRESNEL LENS

Masaru Takasaki, Ebina, and Masutoshi Aoyama, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 5, 1984, Ser. No. 658,220
Claims priority, application Japan, Oct. 11, 1983, 58-188359
Int. Cl.⁴ F21V *5/00*
U.S. Cl. 362—278 **18 Claims**



1. A light assembly comprising:

a housing of thermoplastic resin having a convexly curved mouth;

an electric bulb disposed in said housing;

a fresnel lens of thermoplastic resin, wherein said fresnel lens comprises an originally flat lens which is flexed by a given degree to form said fresnel lens; and

means for securing said lens to the mouth of said housing while flexing same by said given degree.

4,574,339

INTERLOCKING LENS STRUCTURE FOR A SIGNAL LAMP

Harold R. Stine, Delta, Ohio, assignor to Fulton Industries, Inc., Wauseon, Ohio

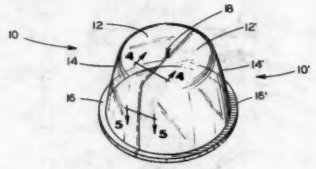
Filed Apr. 27, 1984, Ser. No. 604,877
Int. Cl.⁴ F21V *5/04*
U.S. Cl. 362—360 **13 Claims**

1. A lens piece adaptable for use in an interlocking lens structure comprising:

a top portion including an edge having a first region formed with a groove and a second region formed with a projec-

tion, said groove and projection of said top portion being complementary in dimensions; and

a side portion connected to said top portion including two edges joining said edge of said top portion, one of said side portion edges formed with a groove and the other of said



side portion edges formed with a projection, said groove and projection of said side portion being complementary in dimensions, the depth of said groove and projection of said top portion being different than the depth of said groove and projection of said side portion whereby two of the lens pieces interlock to form a lens structure.

4,574,340

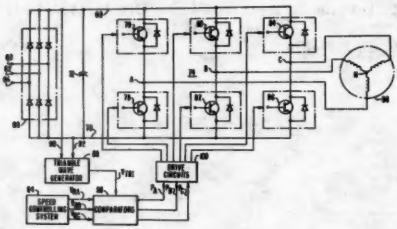
INVERTER WITH CONSTANT VOLTAGE TO FREQUENCY RATIO OUTPUT CAPABILITY

Donal E. Baker, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1984, Ser. No. 623,582

Int. Cl.[4] H02P *5/40*

U.S. Cl. 363—41 **5 Claims**



1. An electronic inverter comprising:

a pair of DC link conductors;

a plurality of output power pole terminals;

an output circuit having a plurality of branch circuits connected in parallel between said DC link conductors, each of said branch circuits including a pair of switching transistors connected in series wherein each output power pole is connected to a point between the transistors in one of said branch circuits;

a plurality of drive circuits for supplying base current to each of said transistors, each drive circuit including a controlled current feedback transformer which uses the collector current of the associated switching transistor to supply the required base drive current; and

means for generating a switching pattern waveform for controlling the duty cycle of each of said switching transistors, said switching pattern alternating between a logic high level and a logic low level wherein each successive logic level lasts for a time which is less than the saturation time of the controlled current feedback transformer in each drive circuit while the period of the fundamental frequency of the inverter output voltage is greater than the saturation time of the controlled current feedback transformer in each drive circuit.

4,574,341

CURRENT SUPPLY APPARATUS FOR AN A.C. CONSUMER

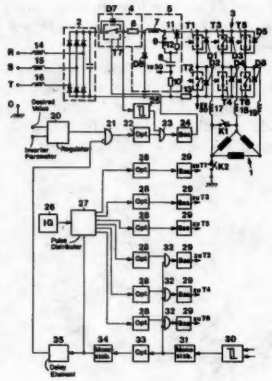
Kjeld Hellegaard, Nordborg, and Hans Doktor, Aarhus C, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 25, 1983, Ser. No. 555,069

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246706

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—56 **3 Claims**



1. A current supply apparatus for an A.C. consumer, comprising, an inverter having a bridge circuit comprising, transistors and relaxation diodes, a rectifier, a transistor chopper between said rectifier and said inverter, a smoothing circuit behind said chopper having a smoothing coil and a smoothing capacitor, base control circuit means respectively for said chopper transistor and said inverter transistors, a first current measuring resistor behind said chopper, a second current measuring resistor in the current return line of said inverter, a pulse generator, a pulse distributor feeding pulses of said pulse generator to said inverter base control circuits, a current regulator feeding control pulses to said chopper base control circuit responsive to an operating parameter of said inverter, means for feeding a blocking signal to said base control circuits of said chopper and said inverter depending on overcurrent measuring signals derived from said first and second current measuring resistor, respective optocoupler means for feeding said control pulses to said chopper and inverter transistor base control circuits, and respective gate means between those of said base circuits and those of said optocoupler means which are associated with said chopper and with said transistors connected to said return line of said inverter, said gate means being feedable with appropriate blocking signals responsive to overcurrent signals detected by said current measuring resistors.

4,574,342

RESONANCE DRIVER

Wesley G. Runyan, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1983, Ser. No. 523,999

Int. Cl.[4] H02M *7/515*

U.S. Cl. 363—134 **7 Claims**

1. A resonant power supply system comprising:

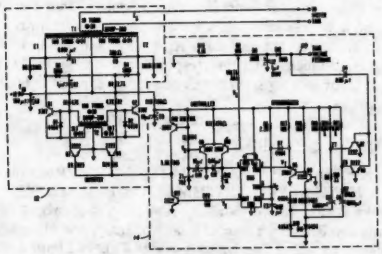
means for providing a DC voltage;

means for converting said DC voltage into an alternating current and providing an alternating current output;

an inductance-capacitance tank circuit coupled to receive said alternating current output and produce a resonant

sinusoidal voltage output across the capacitance of said tank circuit;

means responsive to said resonant sinusoidal voltage output for controlling said means for converting to synchronize and control said alternating current to maintain a constant



voltage, sinusoidal resonant output from said tank circuit; and

a capacitive impedance coupled as an electric load in electrical parallel with capacitance of said tank circuit to receive said resonant sinusoidal voltage.

4,574,343

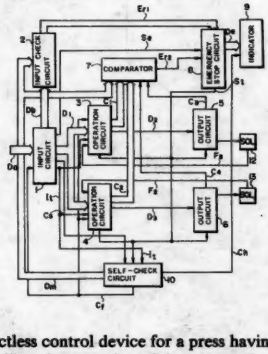
CONTACTLESS PRESS CONTROL DEVICE

Takao Inatomi, Kanazu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,927

Int. Cl.[4] G05B *9/02*; G01R *31/28*; G01P *3/48*

U.S. Cl. 364—184 **1 Claim**



1. A contactless control device for a press having a controller for controlling the operation of the press and an abnormality detector for detecting the abnormality of the operation of said controller, a detection of such abnormality preventing press operation, comprising:

means for generating dummy fault signals before said press is started and applying the signals to said abnormality detector, and

means for detecting as a fault the state when no fault detection signal is generated from said abnormality detector upon application of each dummy fault signal, such fault detection preventing press operation, and

wherein said dummy fault signals correspond to items to be checked, and an initial dummy fault signal is generated when power is fed to said press or when said press is stopped at its top dead center, and the next dummy fault signal is generated only when an abnormality is not detected for each item to be checked.

4,574,344

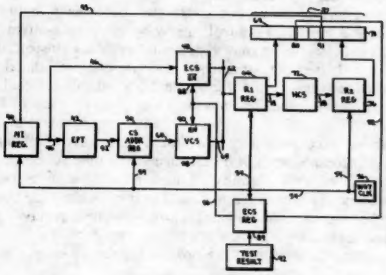
ENTRY CONTROL STORE FOR ENHANCED CPU PIPELINE PERFORMANCE

Richard L. Harris, San Jose, and Robert W. Horst, Cupertino, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Sep. 29, 1983, Ser. No. 537,038

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **6 Claims**



1. In a central processing unit having apparatus for executing macroinstructions emulated by microinstructions having a plurality of lines of microcode, a control store arrangement including:

an entry point table, addressed by said macroinstructions, for providing a pointer related to each of said macroinstructions,

a control store having output lines, responsive to each of said pointers, for providing on output lines connected thereto the second and subsequent lines of said microcode for each of said macroinstructions,

an entry control store, containing the first line of microcode for each macroinstruction, addressed by said macroinstructions, having output lines

Selection means, responsive to microcode indicia in each of said macroinstructions which indicates that execution of the next of said macroinstructions should be started, for selectively connecting said output lines of said control store or said output lines of said entry control store to said bus.

4,574,345

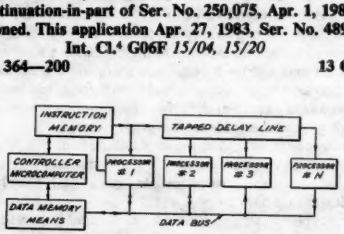
MULTIPROCESSOR COMPUTER SYSTEM UTILIZING A TAPPED DELAY LINE INSTRUCTION BUS

Gregory A. Konesky, Hampton Bays, N.Y., assignor to Advanced Parallel Systems, Inc., Port Jefferson, N.Y.

Continuation-in-part of Ser. No. 250,075, Apr. 1, 1981, abandoned. This application Apr. 27, 1983, Ser. No. 489,169

Int. Cl.[4] G06F *15/04, 15/20*

U.S. Cl. 364—200 **13 Claims**



1. A multiprocessor data processing system, which comprises

(a) a plurality of microprocessor units,

(b) an instruction memory device electrically storing a common set of instructions in a pre-ordered sequence, each of said instructions being stored in representative digital electrical signal form,

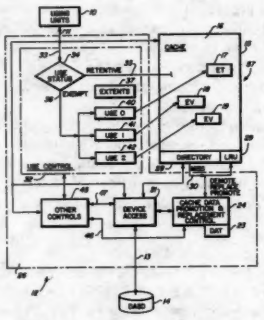
(c) said instruction memory device including an output port,
(d) first electrical control means being associated with said instruction memory device and operable to control said instruction memory device whereby the digital electrical signals representative of each of said instructions are applied to said output port, pursuant to the pre-ordered sequence, one at a time, in a timed sequence,
(e) a tapped delay line instruction bus means having an input port electrically connected to the output port of said instruction memory device and including a plurality of individual tap buses,
(f) said tapped delay line instruction bus means including second electrical control means operable to control the digital electrical signals representative of said instructions applied to the input port in said pre-ordered, timed sequence whereby the digital electrical signals for each of said pre-ordered instructions are applied to each of said individual tap buses, one tap bus at a time, pursuant to said pre-ordered sequence, in a timed, time-skewed sequence synchronized with said first-mentioned time sequence,
(g) each of said plurality of microprocessor units being electrically connected to one of said individual tap buses, whereby each of said microprocessor unit receives the representative electrical signals for each of the instructions pursuant to said pre-ordered, time sequences.

4,574,346

METHOD AND APPARATUS FOR PERIPHERAL DATA HANDLING HIERARCHIES

Michael H. Hartung, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,367
Int. Cl.⁴ G06F *12/08, 13/14*
U.S. Cl. 364—200 **64 Claims**



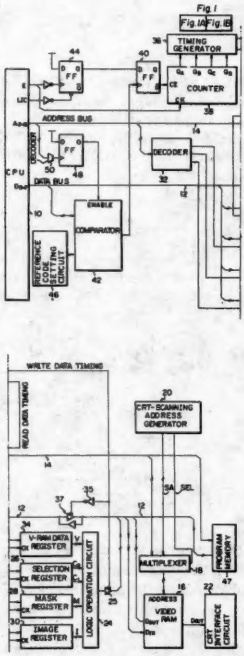
1. In a data-storage hierarchy for being connected to a host processor having a plurality of computer processes for data processing operations and the hierarchy having a rapid-access front store and a slow-access back store; data transfer means coupled to said host processor and to said front and back stores to automatically transfer data therebetween, each store having a plurality of addressable data storage areas;
the improvement including, in combination:
commitment control means for receiving and storing commands from the host processor indicating for each of said addressable data storage areas in said front store either a first type of data receivable from the host processor which is committed to be retentively stored by said hierarchy or for each of said addressable data storage areas in said front store a second type of data receivable from the host processor which is to be exempted from said retentive storage commitment, change means in said commitment control means responsive to the commands received from the host processor for changing said indications for any one of said addressable data storage areas in said front store and connected to said data transfer means for actuating the data transfer means to transfer data between said front store to said back store in accordance with said changed indications; and
data storage control means coupled to said commitment control means and to said data transfer means and having first means for being responsive to the first type of data for storing such received first type of data in said back store and in said front store when access by said host-processor to such first type of data is to be enhanced and having second means for being responsive to the second type of data for storing such received second type of data in said front store.

4,574,347

DATA PROCESSING APPARATUS FOR PERFORMING HIGH-SPEED ARITHMETIC OPERATIONS

Shosuke Mori, Tokyo; Makoto Awaga, Yokohama; Kiminori Fujisaku; Mitsuru Yamauchi, both of Inagi, and Hitoshi Ono, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 7, 1983, Ser. No. 549,472
Claims priority, application Japan, Nov. 8, 1982, 57-194558
Int. Cl.⁴ G06F *7/38*
U.S. Cl. 364—200 **23 Claims**



1. A data processing apparatus, comprising:
a central processing unit for executing a plurality of instruction codes;
a data bus connected to said central processing unit;
memory means, connected to said data bus, for storing data received from said central processing unit via said data bus;
identification means, connected to said data bus, for identifying a predetermined instruction code from the plurality of instruction codes, the predetermined instruction code

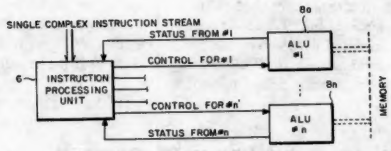
requiring said central processing unit to access said memory means; and

logic operation means, connected to said data bus, said central processing unit and said identification means, for operating on data when the predetermined instruction code is identified, by receiving data from said memory means via said data bus, executing a first operation using the received data to produce data, and writing the produced data in said memory means, said logic operation means receiving, executing and writing while said central processing unit is executing a second operation as instructed by the predetermined instruction code, thereby completing the first operation in less time than said central processing unit would take to complete the first operation.

4,574,348
HIGH SPEED DIGITAL SIGNAL PROCESSOR ARCHITECTURE

Gregory M. Scallon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 1, 1983, Ser. No. 499,842
Int. Cl.[4] G06F *7/00, 9/06*
U.S. Cl. 364—200 **13 Claims**



1. A data processor comprising:

(a) a sequence controller for generating complex instruction address signals identifying addresses of complex instructions, a plurality of said complex instructions forming a program for solving an algorithm,

(b) program memory storage means for storing said complex instructions at address locations identified by said address signals,

(c) a first and second arithmetic and logic unit (ALU) for processing data in accordance with said complex instructions from said program memory storage means,

(d) said complex instructions having first fields for providing first instructions to said first ALU, and distinct, second fields for providing distinct, second instructions to said second ALU,

(e) said first and second fields of said complex instructions simultaneously transmitted respectively to said first and second ALUs for synchronizing the operation of said first and second ALUs in executing said program,

(f) a data memory storage device for storing data,

(g) a data address unit connected to said data memory storage device for generating data addresses to control storage and retrieval of data in said data memory storage device,

(h) said complex instructions including third fields for providing data address instructions,

(i) said data address unit connected to receive said data address instructions of said third fields from said program memory storage device for selecting said data addresses to be generated,

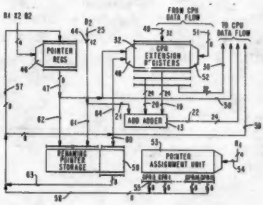
(j) said first and second ALUs connected to receive data from said data memory storage device, and

said third fields of said complex instruction transmitted simultaneously with said first and second fields to synchronize data storage and retrieval of said data memory storage device.

4,574,349
APPARATUS FOR ADDRESSING A LARGER NUMBER OF INSTRUCTION ADDRESSABLE CENTRAL PROCESSOR REGISTERS THAN CAN BE IDENTIFIED BY A PROGRAM INSTRUCTION

Rudolph N. Rechtschaffen, Scarsdale, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 249,270, Mar. 30, 1981, abandoned.
This application Mar. 21, 1984, Ser. No. 591,705
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **4 Claims**



1. A data processing system having main storage means comprising addressable locations containing data and instructions, a central processor including an instruction register connected to the main storage means for receiving and storing instructions including a first binary field representing an address displacement value and indentifying a particular addressable main storage location, one or more second binary fields each identifying one of a predetermined number (n) of instruction addressable general purpose registers, and an operation field specifying an operation to be performed, one operation being a load instruction effecting transfer of data to a specified one of said instruction addressable general purpose registers, and transfer means responsive to a central processor generated main storage address for fetching and transferring to the central processor the data and instructions, the improvement allowing access to a larger number (m) of general purpose registers without increasing the size of said second binary fields comprising:

a plurality m of hardware registers in the central processor for storing data transferred from the main storage means in the central processor, including access means for effecting read-in or read-out of data in said plurality of hardware registers, said plurality m being greater than the predetermined number of instruction addressable general purpose registers identified by the one or more second binary fields of an instruction, and

register renaming means, including means connected and responsive to the first binary field and the second binary fields of a load instruction, and connected to said access means of said plurality m of hardware registers, said register renaming means controlling further access to one of said plurality m hardware registers in response to identification of one of said n instruction addressable general purpose registers.

4,574,350
SHARED RESOURCE LOCKING APPARATUS

Daniel C. Starr, St. Charles, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 19, 1982, Ser. No. 379,731
Int. Cl.[4] G06F *13/00, 13/14*
U.S. Cl. 364—200 **40 Claims**

1. A program controlled system having a memory READ command and a memory WRITE command for reading and writing memory, respectively, by sending the command to memory, the system for selectively treating the conventional memory READ or memory WRITE command either as a

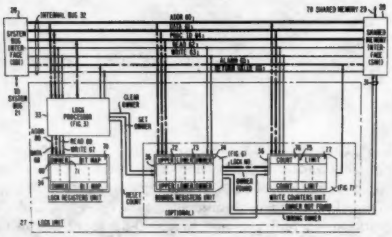
memory command or as a resource locking request, the system comprising:

(A) a plurality of devices for accessing resources;

(B) at least one resource coupled to the plurality of devices for access by the plurality of devices;

(C) resource access controlling apparatus coupled to the plurality of devices for controlling access to the at least one resource by the plurality of devices;

(D) each of the plurality of devices having means for requesting from the resource access controlling apparatus access to a resource by sending one of the memory READ command and the memory WRITE command to the resource access controlling apparatus, and for awaiting a response from the resource access controlling apparatus to the request before continuing operation that includes accessing the resource;



(E) the resource access controlling apparatus including

(1) means, responsive to the one of the memory READ and the memory WRITE commands sent to the apparatus, for determining whether the resource may currently be accessed by a requesting device,

(2) means, responsive to one or more of the one of the memory READ and the memory WRITE commands sent to the apparatus, for selecting for access to the resource a device requesting access to the resource, and

(3) means, cooperative with the determining means and the selecting means and responsive to the one of the memory READ and the memory WRITE commands sent to the apparatus by the selected device, for sending to the selected device a response when the determining means indicate that the resource may be accessed, to grant the selected device exclusive use of the resource.

4,574,351

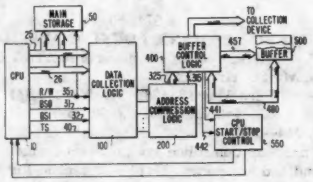
APPARATUS FOR COMPRESSING AND BUFFERING DATA

Lam Q. Dang; Charles P. Geer; Merle E. Houdek; Eugene R. Jones; Frank G. Soltis; John A. Soyring, and Thomas M. Walker, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,944

Int. Cl.[4] G06F *15/74, 5/00*

U.S. Cl. 364—200 **12 Claims**



1. Apparatus for compressing and buffering large amounts of data collected in real time from a computer system having a central processing unit (CPU), control means having an output for starting and stopping said CPU, virtual storage addressed by virtual storage addresses and real storage addressed by real storage addresses formed by converting the virtual addresses to real storage addresses, the improvement comprising;

means for converting said real storage addresses to virtual storage addresses where said virtual storage addresses include a segment identifier and an offset;

compression menas for compressing said virtual storage addresses formed by converting said real storage addresses, said compression means including means for adding leading bits to said offset to distinguish said offset from said segment identifier, means for adding other bits to said offset to relate said offset to a segment identifier and means for temporarily storing only unique segment identifiers of said virtual storage addresses formed by converting said real addresses and for temporarily storing all offsets including said added bits;

buffer means coupled to the compression means for storing said segment identifiers and said offsets temporarily stored by said compression means;

monitoring means for monitoring said buffer means and providing a stop CPU signal to said control means upon said buffer means having a predetermined amount of data; and

emptying means coupled to the monitoring means for emptying said buffer means to a collection device after it has been filled with said predetermined amount of data and for providing a start CPU signal to said control means after said buffer has been emptied.

4,574,352

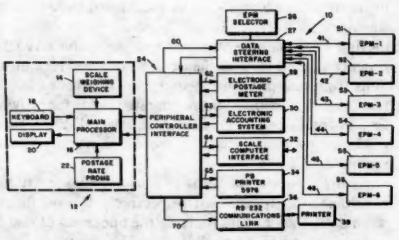
DROP SHIPMENT MAILING SYSTEM

Vincent G. Coppola, Branford; John L. Lorenzo, Southbury; Edwin G. Grisgraber, Shelton, and Flavio M. Manduley, Woodbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 7, 1983, Ser. No. 472,521

Int. Cl.[4] G01G *19/40*

U.S. Cl. 364—466 **10 Claims**



1. A mailing system comprising, in combination, a scale including weighing means for determining weights, data entry means for entering postage value determining data, and processor means responsive to the weights and the postage value determining data for determining postage values; a plurality of electronic postage meters for dispensing postage denominations for mail service, each postage meter adapted to dispense postage denominations for mailing from a selected different postal zone distribution point; a data steering interface for establishing an interconnection between the postage value determining processor and a selected one of said postage meters; and selector means for operator input of a postage meter selection signal for selecting one of the plurality of postage meters, the selector means being interconnected with the data steering interface for directing the data steering interface to establish an interconnection with the selected postage meter.

4,574,353
YARN SUPPLY DEVICE GROUP

Jerker Hellström, Nol; Lars H. G. Tholander, Huskvarna, and Kurt A. G. Jacobsson, Ulricehamn, all of Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

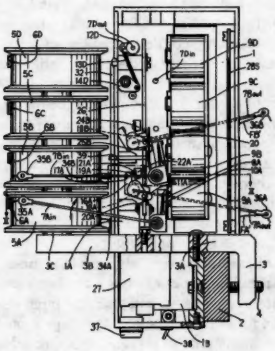
PCT No. PCT/EP82/00238, § 371 Date Jun. 29, 1983, § 102(e) Date Jun. 29, 1983, PCT Pub. No. WO83/01634, PCT Pub. Date May 11, 1983

PCT Filed Nov. 4, 1982, Ser. No. 522,372

Claims priority, application Sweden, Nov. 4, 1981, 8106506

Int. Cl.[4] G06F *15/46;* D04B *15/48*

U.S. Cl. 364—470 **15 Claims**



1. A yarn supply device group, comprising a central control unit, a plurality of yarn supply devices adapted to be attached to a textile machine, and a plurality of conductors which are connected to each said yarn supply device and to said central control unit, wherein each said yarn supply device includes electrically actuable devices and an electronic switching arrangement which controls said electrically actuable devices, each said switching arrangement including a memory which can be written and read and which is adapted to store a unique address sent to the yarn supply device by said central control unit through at least one of said conductors, and wherein said central control unit includes means for sending said unique addresses to said memories of said yarn supply devices when said textile machine is switched on.

4,574,354
METHOD AND APPARATUS FOR TIME-ALIGNING DATA

Michael A. Mihalik, Beaverton; Gerd H. Hoeren, Lake Oswego; Michael G. Reiney, Tigard; James J. Besemer, Portland, and Steven R. Palmquist, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 19, 1982, Ser. No. 442,948

Int. Cl.[4] G06F *15/20;* G01R *31/28*

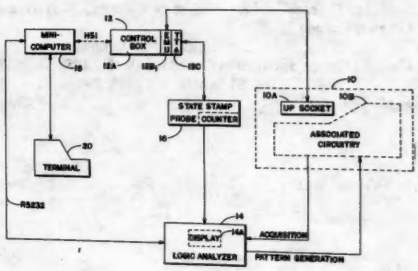
U.S. Cl. 364—481 **10 Claims**

1. A method of time aligning in chronological order a second set of data with a corresponding separately-generated first set of data, comprising the steps of:

acquiring by separate means said first set of data and said second set of data;

producing a series of identifiers wherein an identifier is produced in response to each acquisition of said first set of data;

associating each of said identifiers with said each acquisition of said first set of data and with acquisitions of said second set of data which correspond with said each acquisition of said first set of data; and



grouping said corresponding acquisitions of said first and second sets of data in chronological order in accordance with said series of identifiers.

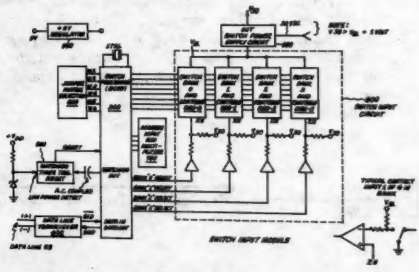
4,574,355
ARRANGEMENT FOR SENSING REMOTE BINARY INPUTS

Robert M. Beatty, Warwick; Edward B. Miller, and Paul G. Huber, both of West Warwick, all of R.I., assignors to General Electric Company, Bridgeport, Conn.

Filed Nov. 2, 1983, Ser. No. 548,110

Int. Cl.[4] H02J *3/10*

U.S. Cl. 364—492 **9 Claims**



1. In a system for controlling distributed electrical loads including a central controller for providing a data signal defining the manner in which said loads are to be controlled; plural transceiver devices, each device being connected to control a subset of said loads by controlling relays in respective power circuits of said loads and including means for receiving contact closure inputs and transmitting information related thereto to the central controller; and a single data line connecting said central controller with each transceiver device, and improved transceiver device, comprising:

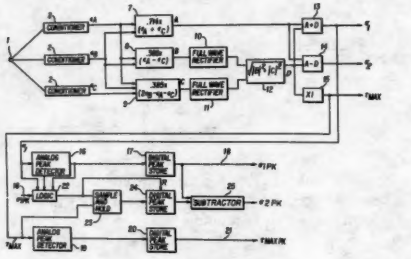
means, coupled to said receiving means, for monitoring the current state of any contact closure input to said transceiver and transmitting information indicative thereof to the central controller.

4,574,356

PEAK DYNAMIC STRESS CALCULATOR

George K. Schattschneider, Victoria, and James R. Matthews, Lower Sackville, both of Canada, assignors to Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Feb. 22, 1983, Ser. No. 468,627
Claims priority, application Canada, Feb. 11, 1982, 468627
Int. Cl.[4] G01B 7/16
U.S. Cl. 364—508 7 Claims



3. Apparatus for the determination of stress in a structural member of a known material, comprising:

a rectangular strain gauge rosette, including a first strain gauge rosette arm located along a principal axis of the structural member to be measured for providing a first input signal ϵ_A, a second strain gauge rosette arm located at a 45° angle to the first arm for providing a second input signal ϵ_B, and a third strain gauge rosette arm located at a 90° angle to the first ram for providing a third input signal ϵ_C;

first analog signal processor means, connected to receive the three input signals ϵ_A, ϵ_B, and ϵ_C, for continuously providing three stress signals, namely, a maximum principal stress signal σ_1 representative of maximum principal stress detected by the rosette, a minimum principal stress signal σ_2 representative of minimum principal stress detected by the rosette, and a maximum shear stress signal τ_{max} representative of maximum shear stress detected by the rosette, for each instantaneous input signal upon receipt of said input signals, the first signal processor means including circuit means having three simultaneous analog transfer functions,

$$\sigma_1 = \tag{1}$$

$$E\left[\frac{\epsilon_A + \epsilon_C}{2(1-\nu)} + \frac{1}{2(1+\nu)}\sqrt{(\epsilon_A - \epsilon_C)^2 + (2\epsilon_B - \epsilon_A - \epsilon_C)^2}\right]$$

$$\sigma_2 = \tag{2}$$

$$E\left[\frac{\epsilon_A + \epsilon_C}{2(1-\nu)} - \frac{1}{2(1+\nu)}\sqrt{(\epsilon_A - \epsilon_C)^2 + (2\epsilon_B - \epsilon_A - \epsilon_C)^2}\right]$$

$$\tau_{MAX} = \frac{\sigma_1 - \sigma_2}{2} = \tag{3}$$

$$\frac{E}{2(1-\nu)}\sqrt{(\epsilon_A - \epsilon_C)^2 + (2\epsilon_B - \epsilon_A - \epsilon_C)^2}$$

where ν and E are first and second constants, respectively, of the structural member material; and

second signal processor means for providing and storing three output signals, namely, a peak maximum principal stress signal σ_{1PK} representative of peak maximum principal stress detected by the rosette, a signal σ_{2PK} representative of minimum principal stress at the instant of peak maximum principal stress, and a peak maximum shear stress signal $\tau_{max\ PK}$ representative of peak maximum shear stress detected by the rosette, in which the second signal processor means comprises

first signal storing means for storing the peak voltage amplitude of the maximum principal stress signal σ_1,

a first comparator having an output, a first input connected to receive said peak voltage amplitude stored by the first signal storing means, and a second input;

a first AND gate having an output, a first input connected to receive the output signal of the first comparator, and a second input connected to receive a clock signal,

a first counter, having an output and having an input connected to the output of the first AND gate;

a first digital-to-analog converter having an input connected to the output of the first counter, for continuously providing the peak maximum principal stress signal σ_{1PK}, the second input of the first comparator being connected to receive the peak principal stress signal σ_{1PK} provided by the first digital-to-analog converter, whereby the first AND gate passes clock pulses which are counted the first counter whenever the peak voltage amplitude applied to the first input of the first comparator exceeds the peak maximum principal stress signal σ_{1PK} applied to the second input of the first comparator,

a second comparator having an output, a first input connected to receive the peak voltage amplitude stored by the first signal storing means, and a second input connected to receive the maximum principal stress signal σ_1, for generating an output signal of a predetermined polarity whenever the maximum stress principal stress signal σ_1 exceeds the stored peak voltage amplitude,

a third comparator having an output, a first input connected to receive the peak maximum principal stress signal σ_{1PK}, and a second input connected to receive the maximum principal stress signal σ_1, for generating an output signal of said predetermined polarity when the maximum stress principal stress signal σ_1 exceeds the peak maximum principal stress signal σ_{1PK},

a second AND gate having an output, a first input connected to the output of the second comparator, and a second input connected to the output of the third comparator,

a sample and hold circuit, having an output, a first input connected to receive the maximum shear stress signal τ_{max}, and a second input connected to the output of the second AND gate, for sampling and holding the peak voltage value of the maximum shear stress signal τ_{max} at the time of occurrence of a new peak maximum principal stress,

a fourth comparator having an output, a first input connected to the output of the sample and hold circuit, and a second input,

a third AND gate having an output, a first input connected to the output of the fourth comparator, and a second input connected to receive the clock signal,

a second counter having an output and having an input connected to the output of the third AND gate,

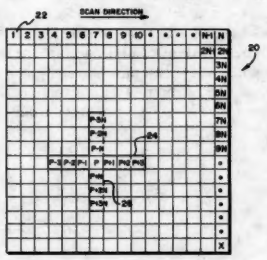
a second digital-to-analog converter, connected to the output of the second counter, for providing a second counter output signal, the second input of the fourth comparator being connected to receive the second counter output signal, and

subtractor means, connected to receive the second counter output signal and the peak maximum principal stress signal σ_{1PK}, for doubling the second counter output signal and subtracting the doubled second counter output signal from the peak maximum principal stress signal σ_{1PK}, to continuously provide the signal σ_{2PK} representative of the minimum principal stress at the instant of peak maximum principal stress.

4,574,357
REAL TIME CHARACTER THINNING SYSTEM

José Pastor, Westport; Harry L. Parker, and David H. Wilson, both of Fairfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 582,109
Int. Cl.[4] G06K 9/44
U.S. Cl. 364—518 35 Claims



1. A system for providing a video output signal representing a thinned image from digitized video input signals representing discrete picture elements (pixels) of a scanned image, comprising:

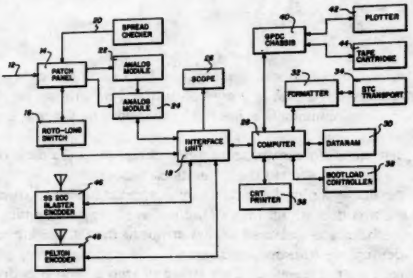
convolver circuit means for identifying those pixels which are to be retained as part of the thinned image, those pixels which are to be discarded from the thinned image, and contingent pixels which may be part of the thinned image; and

matrix filter circuit means electrically coupled to said convolver means for determining which of the contingent pixels are to be discarded and which of the contingent pixels are to be retained as part of the video output signal representing a thinned image.

4,574,358
MONITOR DISPLAY CONTROL

Robert D. Peterson, Plano, and Wayne A. Penner, Farmers Branch, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1982, Ser. No. 418,125
Int. Cl.[4] G01V 1/00
U.S. Cl. 364—550 13 Claims



1. In a seismic data acquisition system including a receiver for receiving and processing seismic data signals from a plurality of channels and a recorder connected to the output of the receiver for recording the seismic data signals, a monitor display comprising:

first means connected to the output of the receiver for converting each seismic data signal from each channel to an amplitude signal by integrating said each seismic data signal;

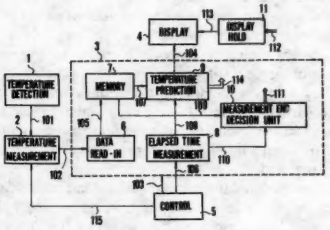
second means for associating each channel of said plurality of channels with a display location; and

display means connected to said first means and said second means for displaying said amplitude signal at a display location corresponding to each channel before recording said seismic data signals.

4,574,359
ELECTRONIC CLINICAL THERMOMETER, AND METHOD OF MEASURING BODY TEMPERATURE

Hideo Ishizaka, and Yoshiki Hanzawa, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,181
Claims priority, application Japan, Dec. 21, 1982, 57-222944; Dec. 21, 1982, 57-222946
Int. Cl.[4] G01K 7/24
U.S. Cl. 364—557 18 Claims



1. An electronic clinical thermometer comprising:

temperature detecting means for detecting temperature at a part of a body and for generating a first signal indicative of the detected temperature;

storage means for sequentially storing the first signal;

elapsed time measuring means for measuring time which has elapsed since start of measurement and for generating a second signal indicative of the measured elapsed time;

first arithmetic means for reading the first signal, corresponding to a prescribed length of past time, out of said storage means to obtain a mean value during said length of past time, and for producing a third signal;

second arithmetic means for obtaining a predicted value of a stable temperature from the second and third signals on the basis of a stable temperature prediction function in which measurement time is a variable, the function defining a temperature change up to final, stable temperature;

first control means in response to which arithmetic operations are performed by said first and second arithmetic means at a predetermined period;

display means for displaying the predicted value of stable temperature; and

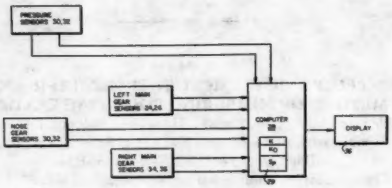
second control means responsive to said elapsed time measuring means for subjecting the first signal and third signal to a comparison at two successive points in time;

wherein after said second control means determines that the second signal has exceeded a first prescribed elapsed time and that a difference exhibited by the third signal corresponding to two successive points in time no longer shows an increase outside a first prescribed range, the third signal corresponding to a present point in time is compared with the third signal at the preceding point in time and, when the first signal exhibits a decrease outside a second prescribed range, said second control means halts the operation of said first and second arithmetic means.

4,574,360
HELICOPTER WEIGHT MEASURING SYSTEM

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Apr. 1, 1983, Ser. No. 481,487
Int. Cl.[4] G01G *19/00*; G06F *15/20*
U.S. Cl. 364—567 7 Claims



1. A weight measuring system for a helicopter having a set of landing gear and a rotating wing for imparting lift having an effective disc area, comprising:

first means for generating a representation of the load supported by the set of landing gear;

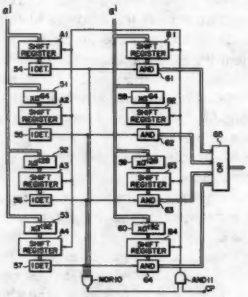
second means including a pressure sensor having an output representing the slipstream pressure developed by the rotating wing, a memory for storing a representation of said effective disc area and means coupled to said pressure sensor and said memory for generating a representation of said lift from said slipstream pressure and said effective disc area; and

third means coupled to said first and second means for calculating an indication of the total weight of the helicopter from said load supported by the set of landing gear and said lift.

4,574,361
APPARATUS FOR DIVIDING THE ELEMENTS OF A GALOIS FIELD

Jun Inagawa, Yokohama; Masahide Nagumo, Kawasaki, and Tadashi Kojima, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 10, 1983, Ser. No. 473,765
Claims priority, application Japan, Jun. 15, 1982, 57-102803; Jun. 15, 1982, 57-102805
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—761 6 Claims



1. An apparatus for dividing one element α^i of a Galois field $GF(2^m)$ consisting of 2^m elements by another element α^j, thus performing a division of $\alpha^i \div \alpha^j$, where α is the root of a modulus polynominal $F(x)$, said apparatus comprising:

a first linear shift register for storing data representing the element α^i;

a second linear shift register for storing data representing the element α^j;

a first "1" detector circuit connected to the output of said first linear shift register;

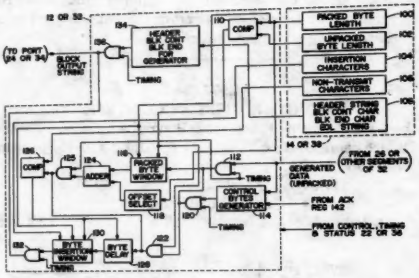
first shift means for detecting the number of times said first "1" detector circuit produces no output and for generating a shift signal to shift said first and second linear shift registers M times according to the detecting result; and

first output means for providing, as a quotient of the division $\alpha^i \div \alpha^j$, that output $\alpha^i \cdot \alpha^M$ of said second linear shift register which is obtained when the output of said first linear shift register controlled by said first shift means becomes $\alpha^j \cdot \alpha^M = 1$, when said first output means receives a "1" detection output of said first "1" detector circuit which is obtained when said first "1" detector circuit detects that $\alpha^j \cdot \alpha^M = 1$.

4,574,362
BLOCK MODE DIGITAL SIGNAL CONDITIONING METHOD AND APPARATUS

Howard R. Spindel, Tualatin; Vincent N. Ast, Jr., Portland, and Gary L. Brown, Tualatin, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 12, 1982, Ser. No. 367,660
Int. Cl.[4] G06F *5/00*
U.S. Cl. 364—900 6 Claims



1. A method of conditioning a digital data string for transmission between a first and a second digital unit on an asynchronous communication line, the method comprising the steps of:

a. determining a maximum number of bits per byte each of the first and second digital units can accept;

b. serializing a plurality of data bytes to be transmitted from the first digital unit into a continuous string of data bits;

c. prefixing a preselected header string to the data string to identify the transmission source;

d. packing the serialized data string of step b. into pseudo-bytes each having a number of bits that is no longer than the smaller of the maximum numbers determined in step a.;

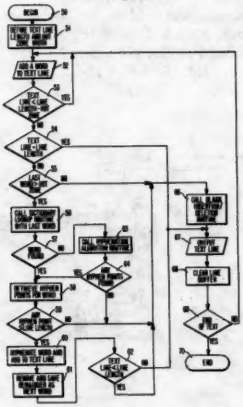
e. appending a preselected control character string following the data string to identify the end of the packed data string; and

f. arithmetically adding an offset value to each pseudo-byte, the value of which is dependent on and preselected for the length of the pseudo-bytes.

4,574,363
MIXED MODE ENHANCED RESOLUTION HYPHENATION FUNCTION FOR A TEXT PROCESSING SYSTEM

Richard G. Carlgren, Gaithersburg; Martin A. Reed, Rockville, and Walter S. Rosenbaum, Bethesda, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,703
Int. Cl.[4] G06F *9/20, 5/00;* B41B *27/10*
U.S. Cl. 364—900 **10 Claims**



1. In a text processing system including at least a central processor, a keyboard, a display, a memory and a printer, an improved method for producing right margin justified text data comprising in combination the steps of:

(a) setting a text line length;

(b) setting a hot zone width less than said text line length;

(c) scanning text data in said memory and concatenating strings of said text data into a text line;

(d) comparing the length of said text line to the set text line length;

(e) inserting a hyphen into a last text string in said text line when the length of said text line exceeds said set text line length;

(f) deleting from said text line an entire portion of said last text string which follows said hyphen;

(g) scanning the text line for text strings equal to members of a set of text strings stored elsewhere in said memory;

(h) adding space to said text line preceding and following said text strings equal to said members of said stored set of text strings until said text line length equals said set line length; and

(i) printing said text line, whereby said text line ends with said hyphen at an end of said set text line length as a result of the addition of space before and after text strings in said line equal to members of said set of text strings stored elsewhere in said memory.

4,574,364
METHOD AND APPARATUS FOR CONTROLLING IMAGE DISPLAY

Kuniaki Tabata, Tokyo; Susumu Tsuhara; Tetsuo Machida, both of Sagamihara; Hidefumi Iwami, Machida, and Yasuyuki Okada, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

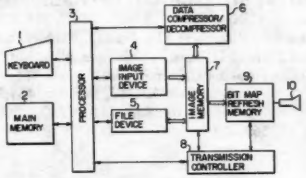
Filed Nov. 23, 1982, Ser. No. 443,872
Int. Cl.[4] G06F *3/153*
U.S. Cl. 364—900 **10 Claims**

1. An image display control system comprising:

a file device for storing a plurality of image data;

image display means for displaying partial areas of said image data in a plurality of windows on a display screen;

a memory containing a file management table for managing information including titles of image data stored in said file device and storage addresses therefor and a window management table for managing information including locations and sizes of the windows on the display screen, titles of the image data, window levels indicative of the order of superposition of the windows on the display screen and quarry locations of the image data in the memory;



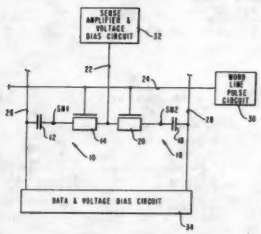
an input device for inputting commands and data on said locations and sizes of the windows, said titles of the image data, said window levels, and the quarry locations of the image data for storage in said memory; and

a processor connected to said image display means, said memory, said input device and said file device for reading out the image data from said file device in accordance with a command indicative of execution of display inputted from said input device for controlling the display of the desired quarried images obtained from said file device in the windows of said image display means on the basis of data stored in said file management table and said window management table.

4,574,365
SHARED ACCESS LINES MEMORY CELLS

Roy E. Scheuerlein, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,808
Int. Cl.[4] G11C *13/00, 11/24*
U.S. Cl. 365—149 **26 Claims**



20. A memory comprising

a sense line,

first and second bit lines,

first switching means having a control electrode interposed between said sense line and said first bit line,

a first storage capacitor having a first conductive plate connected to said first bit line and a second conductive plate connected to said sense line through said first switching means,

second switching means having a control electrode interposed between said sense line and said second bit line,

a second storage capacitor having a first conductive plate connected to said second bit line and a second conductive

plate connected to said sense line through said second switching means,

a word line connected to said control electrodes,

means for selectively applying a voltage pulse to said word line,

means for selectively applying a voltage to said sense line, and

means for selectively applying data signals to said first and second bit lines.

4,574,366

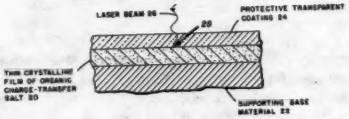
OPTICAL STORAGE AND SWITCHING DEVICES USING ORGANIC CHARGE TRANSFER SALTS

Richard S. Potember; Theodore O. Poehler, both of Baltimore, and Richard C. Benson, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 7, 1983, Ser. No. 464,771

Int. Cl.[4] G11C *11/00*

U.S. Cl. 365—153 **75 Claims**


LASER BEAM 26
PROTECTIVE TRANSPARENT COATING 24
THIN CRYSTALLINE FILM OF ORGANIC CHARGE-TRANSFER SALT 20
SUPPORTING BASE MATERIAL 22

1. An optically sensitive apparatus comprising:

an organic charge transfer salt formed from a donor complexed with an organic electron acceptor; and,

a source of electromagnetic energy at optical frequency, said electromagnetic energy illuminating an area on said organic electron charge transfer salt and causing said illuminated area to undergo an electrochemical topotactic redox reaction which causes a charge transfer between said organic electron acceptor and said donor, thereby switching said illuminated area from an equilibrium state to a second state, said second state having a detectably different charge distribution from said equilibrium state.

4,574,367

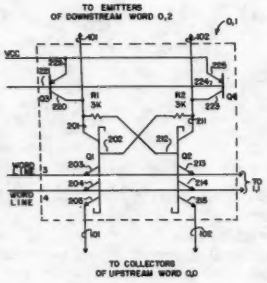
MEMORY CELL AND ARRAY

Barry A. Hoberman, Palo Alto, and William E. Moss, Sunnyvale, both of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Nov. 10, 1983, Ser. No. 551,736

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—179 **8 Claims**



5. A memory array comprising a plurality of rows and columns of memory cells wherein each of said memory cells comprises:

a first and a second transistor in a first row, each of said transistors comprising a plurality of electrodes including a first, a second and a third emitter, a base and a collector;

means for coupling each of said first and said second transistors to a pair of corresponding transistors in an adjacent row of said memory cells in said array; and

means for applying predetermined potentials to said electrodes for transferring a bit of information between said first and said second transistors and said corresponding transistors in said adjacent row.

4,574,368

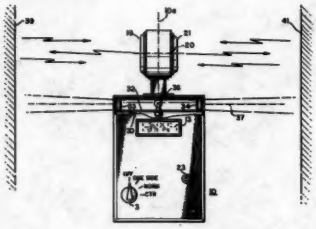
DISTANCE MEASURING SYSTEM USING ULTRASONIC RANGING

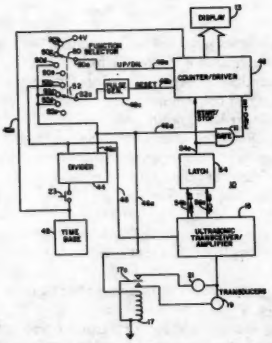
James N. Lipschutz, Gulph Mills, Pa., assignor to Record Industrial Company, King of Prussia, Pa.

Filed Feb. 23, 1983, Ser. No. 469,090

Int. Cl.[4] G01S *15/10, 7/56*

U.S. Cl. 367—108 **9 Claims**





1. A system for measuring the distance between a first and a second object comprising:

a first and second ultrasonic transducer;

switching means including counter means for energizing the first transducer to transmit a first ultrasonic pulse to said first object and thereupon actuating the counter means to begin the start of an initial count, means for stopping the initial count by said counter means when the first ultrsonic pulse is received by said first transducer;

said switching means including timing means for energizing the second transducer to transmit a second ultrasonic pulse to said second object only after a delay interval which begins at the start of the initial count and is substantially equal to the maximum range of the first transducer thereby causing the first ultrsonic pulse to be entirely dissipated before transmitting the second pulse;

restarting the initial count by the counter means upon transmittal of the second ultrasonic pulse; and

means for stopping the restarted count when the second ultrasonic pulse is received by the second trnsducer and means for displaying the resultant count as a number

related to the total distance between the first and second objects.

4,574,369

TRACKING/FOCUSING DEVICE FOR POSITIONING AN OPTICAL LENS UNIT

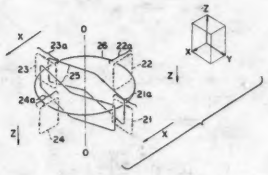
Hiroshi Koide, Sagamihara; Junichi Watanabe, Kawasaki, and Shigemoto Tenmyo, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 461,741

Claims priority, application Japan, Jan. 28, 1982, 57-12143; May 28, 1982, 57-90956; May 31, 1982, 57-91472; May 31, 1982, 57-98638; Jun. 9, 1982, 57-99042; Jun. 10, 1982, 57-99586

Int. Cl.[4] H04N *5/781;* **G11B** *7/00, 21/00*

U.S. Cl. 369—44 **6 Claims**



1. An optical positioning device for positioning an optical lens unit relative to information recording tracks on an optical recording surface comprising:

a body case having a vertical passageway with a central vertical axis;

a bobbin moveably disposed in said vertical passageway and supporting said optical lens unit, and having a vertical hollow defined therein; top and bottom support members resiliently connecting respective top and bottom portions of the bobbin to wall portion of the vertical passageway so that said bobbin can move in both a vertical direction and a horizontal direction;

a first coil wound around a vertical axis of said bobbin;

a second coil would around a horizontal axis of said bobbin and circumscribing the bobbin in a vertical plane near the central vertical axis of the vertical passageway;

magnetic field generating means including an inner portion located in the hollow of said bobbin and an outer portion located outside said bobbin, said inner and outer portions defining a magnetic flux gap whose magnetic flux intersects both first and second coils so that the bobbin moves in said vertical direction when current is passed through the first coil and in said horizontal direction when current is passed through the second coil.

4,574,370

SOUND REPRODUCTION SELECTION APPARATUS FOR A SIMPLIFIED SOUND REPRODUCING DEVICE

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,839

Claims priority, application Japan, Aug. 23, 1984, 59-175535

Int. Cl.[4] G11B *3/40, 17/00*

U.S. Cl. 369—65 **5 Claims**

1. A sound reproducing selection apparatus for a simplified sound reproducing device comprising:

a casing;

an aperture formed in the casing;

a tone arm swingably mountable within the casing;

a center pin mounted within the casing;

a turn table rotatably supported by the center pin;

a sound reproducing stylus mounted on the tone arm and projecting toward the aperture in the casing;

an electric motor mounted within the casing for rotating the turn table;

a speaker diaphragm attached to the turn table opposite from the tone arm;

a record holder swingably attached at one end to the casing adjacent the aperture in the casing and having a record disc fixing portion formed at an opposite end;

first means for biasing the record holder away from the aperture in the casing;

the record holder being movable against the force of the first biasing means to a position parallel to the turn table;

a record disc having a plurality of record grooves formed therein, each of the record grooves having starting and end points of sound reproduction, the starting points of sound reproduction on each of the record grooves being spaced along the outer circumference of the record disc;

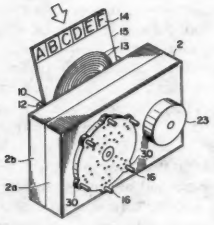
indexing means formed on the record disc for showing the item to be recorded in each record groove;

the record disc being insertable into the record holder with the indexing means being visible from outside of the record holder;

the sound reproducing stylus being engageable with the record disc when the record holder is urged against the force of the first biasing means;

means for temporarily stopping the sound reproducing stylus at a position in which the sound reproducing stylus can engage one of the record grooves in the record disc, the stopping means including;

(a) a plurality of selection poles corresponding in number to the number of record grooves on the record disc depressably mounted on the casing and extending into the casing;



(b) a stopper projecting radially outward from the outer periphery of the turn table and creating a locus of rotation about the periphery of the turn table upon rotation of the turn table; and

(c) the selection poles projecting onto the locus of rotation of the stopper when any one of the selection poles is depressed from outside of the casing;

a source of electrical power;

means for connecting the source of electrical power to the motor to rotate the motor after the sound reproducing stylus has engaged the selected record groove, the connecting means including:

(a) a plurality of electrically conductive energizing members respectively engageable with one of the selection poles;

(b) second means for biasing each of the selection poles toward the outside of the casing;

(c) a metal guide plate holding the selection poles along the periphery of the turn table and guiding the selection poles onto the locus of rotation of the stopper, the metal guide plate being capable of engaging the second biasing means;

(d) a projection formed on each of the selection poles, the projection urging the second biasing means into contact with the metal guide plate when the selection pole associated with the second biasing means is depressed; and

(e) the second biasing means associated with one of the

selection poles which is depressed and the metal guide plate forming a pair of contacts to complete a circuit between the source of electrical power and the motor to connect electrical power to the motor and cause rotation of the motor.

4,574,371

APPARATUS FOR RECORDING AND REPRODUCING INFORMATION ON AN OPTICAL DISC

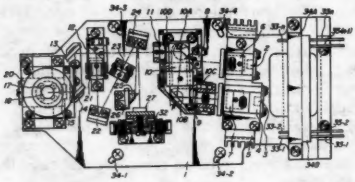
Haruhiko Takemura, Hino; Kiichi Kato, Hachioji, and Masaharu Sakamoto, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Japan

Filed Feb. 16, 1983, Ser. No. 466,910

Claims priority, application Japan, Feb. 20, 1982, 57-25243; Mar. 2, 1982, 57-28413[U]; Mar. 2, 1982, 57-28414[U]; May 11, 1982, 57-78680

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—100 **31 Claims**



1. An apparatus for recording and reproducing information on and from an optical disc recording medium comprising:

recording and reproducing light sources;

an objective lens for focussing recording and reproducing light beams emitted from the recording and reproducing light sources onto the optical disc record medium;

a single composing optical member arranged between the light sources and the objective lens and having a reflection surface which reflects one of the recording and reproducing light beams and an optical surface upon which the light beam reflected by said reflection surface is made incident at an incident angle not smaller than a critical angle of total reflection and the other light beam is made incident at an incident angle substantially equal to Brewster's angle so that almost all of the other light beam is transmitted through the optical surface, for emitting composed recording and reproducing light beams; and

means comprising a plurality of optical members for directing the composed recording and reproducing light beams toward the objective lens.

4,574,372

LOCKING DEVICE FOR RECORD PLAYER APPARATUS

Stéphane M. A. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S.A., Brussels, Belgium

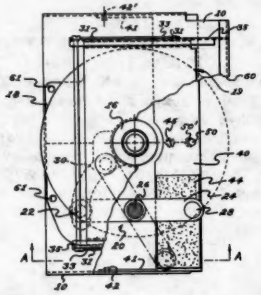
Filed Jan. 4, 1984, Ser. No. 568,141

Claims priority, application Belgium, Jan. 18, 1983, 209919; Jun. 30, 1983, 211089

Int. Cl.⁴ G11B *3/10, 7/00*

U.S. Cl. 369—244 **4 Claims**

1. In a record player having a movable record positioning means for translating a record from an inoperative load position to an operative play position, and a movable scanning support for operatively associating a laser carried by the support with a rotating record, the improvement comprising locking means associated with the movable scanning support having a locked position for engaging said support to restrain movement thereof and an unlocked position for freeing said support for scanning the record, and actuator means associated with the locking means for rendering said locking means locked when the player is switched off and including means for engaging the movable record positioning means for rendering



said locking means unlocked when the record positioning means is in the play position.

4,574,373

DIGITAL MULTIPLEX DEVICE

Reijo Ahola, Espoo, Finland, assignor to Oy Noki AB, Helsinki, Finland

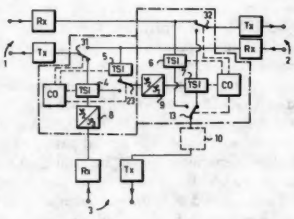
PCT No. PCT/FI83/00038, § 371 Date Dec. 23, 1983, § 102(e) Date Dec. 23, 1983, PCT Pub. No. WO83/03937, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 29, 1983, Ser. No. 567,854

Claims priority, application Finland, May 3, 1982, 821550

Int. Cl.⁴ H04J *1/10, 3/08, 3/02;* H04Q *11/04*

U.S. Cl. 370—58 **9 Claims**



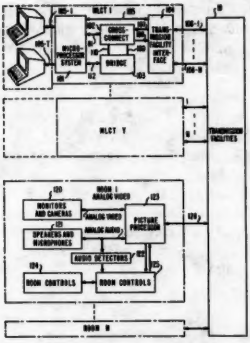
1. A digital multiplex device in an apparatus for branching a synchronous time multiplexed digital information stream between first, second and third ports, each of said ports including a transmitter and receiver, the device comprising first and second selectively activated phase controlling networks, each of said networks including: first and second input terminal means and first and second output terminal means, first and second time division multiplexers, first and second switch means and a phase changer, the first multiplexer being directly connected to the first input terminal means of the respective network, the phase changer having an input directly connected to the second input terminal means of the respective network and an output directly connected to a first input of the second multiplexer of the respective network, the first switch means selectively connecting the first input terminal means of the network to the first output terminal means of the respective network or for connecting a first output of the second phase changer to the first output means of the respective network, the second switch means selectively connecting the second output terminal means to be responsive to an output of the first multiplexer of the respective network or to a second output of the second multiplexer of the respective network; first input terminal means of the first and second networks being adapted to be respectively responsive to output signals of the receivers

of the first and second ports, the first output terminal means of the first and second networks being adapted to respectively supply signals to inputs of the transmitters of the first and second ports, the second input terminal means of the second network being adapted to be connected to the second output terminal means of the first network, the second input terminal means of the first network being adapted to be connected to an output of the receiver of the third port, the second output terminal means of the second network being adapted to be connected to an input of the transmitter of the third port.

4,574,374
MULTILOCATION VIDEO CONFERENCE TERMINAL INCLUDING RAPID VIDEO SWITCHING

Dominick Scordo, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1983, Ser. No. 545,363
Int. Cl.[4] H04Q *11/04*; H04J *3/08*
U.S. Cl. 370—62 **14 Claims**



1. In apparatus for transmitting video and audio information to a plurality of remote locations:

means associated with each of the remote locations for receiving at least first and second digital signals from each remote location, one of said at least first and second received signals includes video control signals in first prescribed bit locations, audio information in second prescribed bit locations and video information in third prescribed bit locations and the other of said at least first and second received signals includes video information, and said receiving means includes first formatting means for inserting said control signals and said audio information into first predetermined time slots of a first corresponding digital signal, for inserting said video information from said one of said at least first and second received signals into second predetermined time slots of said first corresponding signal and for inserting said video information from said other of said at least first and second received signals into third predetermined time slots in an at least second corresponding digital signal for the location;

means for processing said audio information from each of said remote locations into audio information to be transmitted to each of said remote locations;

second means for formatting said processed audio information for each remote location into predetermined fixed time slots assigned to the corresponding location in a plurality of composite signals associated on a one-to-one basis with the remote locations;

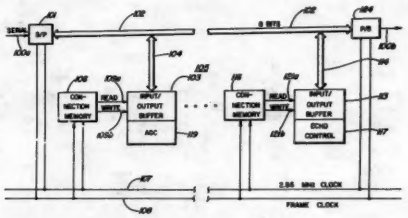
means associated with said receiving means for generating said plurality of composite signals, said generating means including means for combining said formatted audio information with said formatted video information to generate said composite signal for each location including the video information from that location in first predetermined time slots and the processed audio information for each of the plurality of locations in second predetermined time slots corresponding to the locations, wherein each of said composite signals includes all the video information from an associated location and the processed audio information for all of the remote locations; and

means supplied with said plurality of composite signals for controllably selecting any of said composite signals for transmission to any of said remote locations.

4,574,375
INTERFACE ARRANGEMENT FOR A TELEPHONE SYSTEM OR THE LIKE

Michael F. Kemp, and Claude J. Champagne, both of Ontario, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 12, 1983, Ser. No. 541,080
Int. Cl.[4] H04Q *11/04*; H04J *3/02*
U.S. Cl. 370—67 **6 Claims**



1. An interface means for applying information from a channel of a first digital bus to at least one processing circuit and for returning said information, after processing, to a respective channel, said means characterized by:

a serial to parallel converter means for transforming the digital data on said first bus to parallel digital data on a second digital bus;

a plurality of circuit means for selectively accessing said second bus, each said circuit means under the control of a respective connection memory means;

each said connection memory means responsive to timing signals for controlling the access of an associated circuit means to said second bus such that said associated circuit means accesses said second bus at the appropriate time to receive the digital information from a selected channel on said second bus, and also accesses said bus at the appropriate time to transmit the digital information to a selected channel on said second bus.

4,574,376
ACTIVATION OF A TRANSMISSION LINK BY CODE SENDING

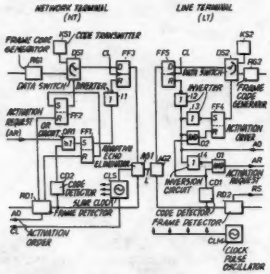
Ingemar E. Dahlqvist, Johanneshov, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00451, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/02816, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 14, 1983, Ser. No. 626,866
Claims priority, application Sweden, Dec. 30, 1982, 8207517
Int. Cl.[4] H04J *3/06*; H04L *7/00*
U.S. Cl. 370—103 **2 Claims**

1. A method in a telecommunication system for activating means from idling state to active state, there being included in the system a digital transmission link consisting of a subscriber side including a network terminal (NT) assigned to the subscriber, and a station side including a line terminal (LT) assigned to the station, said line terminal being connected to a clock pulse oscillator constituting the master clock for the system, and said network terminal being connected to a local

clock pulse oscillator constituting a slave clock characterized in that;

for activation initiated by a subscriber said network terminal (NT) is adapted for receiving an activation request from a connected subscriber, and that said terminal (NT) on reception of the activation request is caused to send a code corresponding to the request in the form of a binary, continuous and cyclic bit pattern with plesiochronous clock pulse rate to the line terminal (LT) through the line (L), and that said line terminal is adapted for detecting said activation request and in response thereto is to send back to the subscriber side an activation order signal in the form of binary data in frame format including synchronizing information, and that on reception of said frame format the network terminal (NT) interprets this as an activation order, and is adapted for synchronizing its own clock pulse rate with the master clock information in the incoming bit flow, and that for received frame synchronizing information the network terminal is caused to send an activation order to the subscriber and to send data in



frame format including frame synchronizing information back again to the station side, and that the line terminal is adapted to detect said data in frame format and in response to the result send acknowledgement signals to the station,

and that for station-initiated activation, the line terminal (LT) is adapted for directly sending an activation order in the form of a continuously transmitted cyclic bit pattern which, on detection in the network terminal (NT), is arranged to trigger sending a corresponding continuous cyclic bit pattern from the network terminal to the line terminal, and that the pattern is disposed for detection in the line terminal, which is adapted for transmitting data in frame format including synchronizing information back to the subscriber side, and that the network terminal, on detection of frame synchronism, is caused to send an activation order to the subscriber and to send data in frame format including frame synchronism to the line terminal, and that the line terminal (LT) is adapted to detect said data in frame format and in response to the result is caused to send acknowledgement signals to the station.

4,574,377

SYNCHRONIZATION METHOD AND APPARATUS IN REDUNDANT TIME-DIVISION-MULTIPLE-ACCESS COMMUNICATION EQUIPMENT

Sachio Miyazaki, Tokyo, and Shinichiro Aoki, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 18, 1983, Ser. No. 553,073

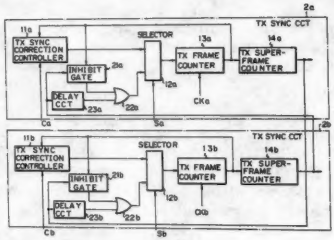
Claims priority, application Japan, Nov. 26, 1982, 57-205977

Int. Cl.[4] H04J *3/06*; H04L *3/00*

U.S. Cl. 370—104 **10 Claims**

1. A synchronization method in redundant time-division-multiple-access communication equipment having at least an active transmission synchronization circuit for generating an active transmission frame timing signal and a standby transmission synchronization circuit for generating a standby transmission frame timing signal, said method comprising the steps of:

(a) synchronizing the standby transmission frame timing signal to a frequency divided signal based on the active



transmission frame timing signal at timings where the frequency divided signal is supplied; and

(b) independently running the standby transmission frame timing signal at timings where the frequency divided signal is not supplied.

4,574,378

MULTIPLE ACCESS SYSTEM AND METHOD

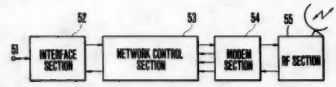
Kazutomo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,264

Claims priority, application Japan, Jun. 14, 1982, 57-101913; Feb. 24, 1983, 58-29741; Mar. 11, 1983, 58-40057

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—104 **11 Claims**



1. A multiple access system for performing packet communication involving the sharing of a single communication medium by a plurality of users through a plurality of channels such that each user monitors the state of each channel and the probability of packet transmission is controlled in accordance with the monitored results comprising:

an interface section for linking data together as a packet;

a modem section for modulating/demodulating a packet, said modem section including

a modulator for modulating the packet;

a demodulator for demodulating a modulated packet to generate a demodulated signal; and

a slot sync signal detector for receiving the demodulated signal to extract the slot sync signal constantly propagated along the channel;

a carrier detector for detecting whether or not the channel is being used and for generating an empty or a busy signal;

a network control section for performing access control, said network control section including

a collision detector for detecting a transmitting packet and a delayed receiving packet so as to detect a collision of the transmitting packet with another transmitting packet, said collision detector generating a success signal when the transmitting packet and the delayed receiving packet coincide with each other and a collision signal when the transmitting packet and the delayed receiving packet do not coincide,

a retransmitter for retransmitting a packet identical with the transmitting packet when the transmitting packet collides with said delayed receiving packet, and

a control circuit for receiving a slot sync pulse, a busy or empty signal, a success or collision signal, and a packet arrival pulse, and for generating a control signal to control packet transmission; and

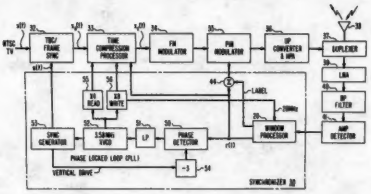
an RF section connected to said modem section for converting an IF signal to a high frequency transmission signal and vice versa.

4,574,379

SYNCHRONIZATION TECHNIQUE FOR NON-COLOCATED TV SIGNALS IN A TDMA SATELLITE COMMUNICATION SYSTEM

Kai Y. Eng, Cliffwood Beach, and Barin G. Haskell, Tinton Falls, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 16, 1983, Ser. No. 505,099
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—104 **9 Claims**



1. Apparatus for synchronizing television burst signal transmissions from a ground station to arrive at a distant station in a separate time slot of a time division multiple access (TDMA) sequence from other similar burst signals from other ground stations of a communication system, the apparatus comprising:

processor means (**20**) capable of detecting whether one or more existing time slot burst transmissions are received from the other ground stations within a frame period of the TDMA sequence and then generating an output window signal corresponding to either (a) a first time slot burst transmission period in the frame period of the TDMA sequence when no time slot burst transmissions from the other ground stations are detected, or (b) a next vacant time slot burst transmission period of the TDMA sequence when one or more existing time slot burst transmissions are detected, for use in transmitting the ground station's television burst signals to the distant station;

oscillator means (**52**) capable of generating a standard television color subcarrier frequency as an output signal;

synchronous generating means (**53**) responsive to the output signal from the oscillator means for generating standard television line or field period timing signals as an output signal which are in phase with the output signals from the oscillator means for aligning input television line or field signals, respectively, with synchronized time slot periods of the TDMA sequence;

means (**32–35**) responsive to the output signals from the synchronous generating means, the oscillator means and the processor means for transmitting a predetermined plurality of time compressed television line or field signals from a separate television program in each television burst signal; and

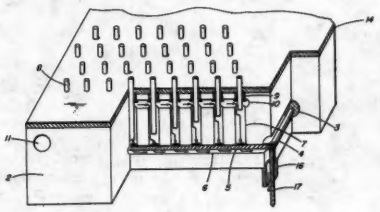
phase detecting means (**50**) responsive to the output signals from the processor means and synchronous generating means for detecting a difference in phase between the two signals and for generating an output signal representative of such phase difference which will appropriately change the phase of the output signal of the oscillator means and, in turn, the output signal of the synchronous generating means to cancel said detected phase difference.

4,574,380

SELF-OPTIMIZING ELECTRODE AND PULSE-STABILIZED SUPER HIGH POWER C.W. GAS LASERS

Kyong H. Nam, 11130 - 24A Ave., Edmonton, Alberta, Canada T6J 4Y9

Filed Nov. 29, 1982, Ser. No. 445,183
Claims priority, application Canada, Jun. 24, 1982, 405873
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **31 Claims**



1. A self-optimizing electrode assembly for a high power gas laser comprising:

(a) a plurality of electrical energy conducting electrode elements physically and electrically separated from one another;

(b) a heat resisting dielectric body in which said electrode elements are supported, one end of said electrode elements protruding from said dielectric body;

(c) an inlet channel for transporting an aqueous solution into and through said dielectric body;

(d) an outlet channel for transporting the aqueous solution through and out of said dielectric body;

(e) a plurality of transverse channels corresponding in number with the plurality of electrode elements, each transverse channel surrounding at least a portion of its respective electrode, each channel connecting with the inlet channel and the outlet channel, each of said transverse channels isolating physically and electrically a respective end of an electrode element opposite the end of the electrode element protruding from the dielectric body;

(f) at least one electric conductor spaced from the ends of the plurality of electrode elements opposite the ends protruding from the dielectric body to form a series of gaps, the conductor being used for distributing electrical energy to the plurality of electrode elements; and

(g) means for transporting an electrical energy conducting aqueous solution through the inlet, transverse and outlet channels.

4,574,381

APPARATUS FOR ESTABLISHING AND MAINTAINING A STABLE DISCHARGE ACROSS A STREAM OF FLOWING GAS, PARTICULARLY USEFUL FOR HIGH-POWER LASERS

David Katz, Tel Aviv, Israel, assignor to Metalworking Lasers International Ltd., Neve Sharett, Israel

Filed Sep. 30, 1982, Ser. No. 431,253
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **8 Claims**

1. Apparatus for establishing and maintaining a stable discharge across a stream of gas flowing through a gas-flow channel, comprising:

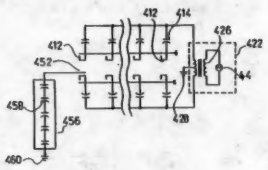
an electrode system including a group of working electrodes disposed on opposite sides of the gas flow channel and spaced longitudinally thereof in the direction of gas flow, which working electrodes include at least one upstream electrode at the upstream end of the gas flow channel;

a high-voltage alternating current source connected at one

side to each of said working electrodes and at the opposite side to a point of fixed reference potential;

and a ballast impedance connected to each of said working electrodes for stabilizing the electrical discharge;

said electrode system further including at least one starting electrode adjacent to said upstream working electrode



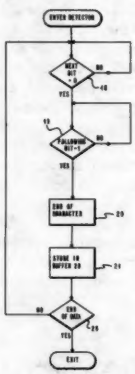
and connected to said point of fixed reference potential via a ballast impedance value than those connected to said working electrodes, such that said starting electrode is effective to bring the point of fixed reference potential to the upstream working electrode to start the discharge, and to draw little current after the discharge has been started.

4,574,382

VARIABLE LENGTH CHARACTER CODE SYSTEM

Michael A. Ko, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,249
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—25 **5 Claims**



1. A digital communication system for transmitting variable length code representations of a set of characters comprising

means for transmitting a data stream comprising a sequence of variable length digital code representations of said characters and a fixed digital code representation having a predetermined bit sequence following the end of each character representation, said predetermined bit sequence occurring only within said fixed digital code representation, wherein said fixed digital code representation forms an integral part of each of said variable length digital code representations, and

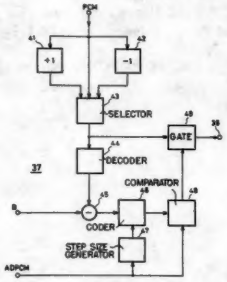
means for receiving said data stream including decoding means for reading fixed code representations in order to determine the end of each variable length character representation.

4,574,383

DECODER OF ADAPTIVE DIFFERENTIAL PULSE CODE MODULATION

Kazunari Irie, Tokyo; Masahiro Taka, and Hideyo Murakami, both of Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,194
Claims priority, application Japan, Dec. 6, 1982, 57-213602
Int. Cl.[4] H04B *14/06*
U.S. Cl. 375—27 **6 Claims**



1. A decoder for adaptive differential pulse code modulation (ADPCM) input signals developed with a predetermined prediction logic, comprising:

means for decoding an input ADPCM signal,

means for adding a prediction signal to the output signal from said decoding means,

prediction means fed with an output signal from said adding means for generating said prediction signal at a logic equal to said predetermined prediction logic and supplying said prediction signal to an input of said adding means for adding therein as aforesaid,

coding means for coding the output signal from said adding means as a PCM signal having a nominal code value, and,

transcoding means operative on three signals namely said ADPCM signal, said prediction signal and said nominal valued PCM signal for developing a desired PCM signal, including:

means for generating a PCM signal having a value one step higher than said nominal code value and a PCM signal having a value one step lower than said nominal value,

means for selecting one of the said nominal higher and lower valued PCM signals,

second decoding means for decoding the selected PCM signal from said selecting means,

substraction means for subtracting the output signal of said decoding means and the output prediction signal from said prediction means,

second means for coding said subtraction into an ADPCM signal having a logical value, by a step size of said input ADPCM signal,

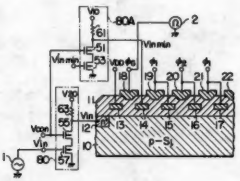
means for comparing the logical value of the output ADPCM signal from said second coding means with that of said input ADPCM signal, and

gate means for gating out the output PCM signal from said selecting means when the comparing means has an equal output.

4,574,384
SIGNAL TRANSFER SYSTEM USING A CHARGE TRANSFER DEVICE

Toshinori Murata, Yokohama; Masafumi Kazumi, Tokyo, and Yuji Ito, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1983, Ser. No. 525,696
Claims priority, application Japan, Aug. 25, 1982, 57-146156; Sep. 17, 1982, 57-160972
Int. Cl.[4] H03K *23/46*
U.S. Cl. 377—58 **12 Claims**



1. A charge transfer system comprising:

a charge transfer device having a semiconductor substrate including a diffusion region, a first region adjacent to said diffusion region, a second region adjacent to said first region, and a third region to which charge carriers stored in said second region are transferred, a first electrode disposed above said first region and insulated from said substrate, and a second electrode disposed above said second region and insulated from said substrate, said charge carriers being responsive to a voltage difference between a voltage applied to said diffusion region and a voltage applied to said second electrode when a clock pulse is applied to said first electrode;

a signal source for generating an electrical signal to be charge-transferred;

a clock pulse source for supplying said clock pulse to said first electrode of said charge transfer device;

signal supply means connected between said signal source and said diffusion region of said charge transfer device for controlling an amplitude of a signal applied to said diffusion region; and

control means for supplying a bias voltage varying with a change of a peak value of said electrical signal to said second electrode of said charge transfer device so as to maintain a minimum value of said charge carriers corresponding to said peak value of said electrical signal at a relatively constant value.

4,574,385
CLOCK DIVIDER CIRCUIT INCORPORATING A J-K FLIP-FLOP AS THE COUNT LOGIC DECODING MEANS IN THE FEEDBACK LOOP

Charles E. Huffman, Plano, and Jeffrey L. Foust, Dallas, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

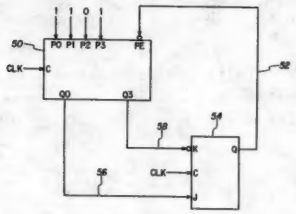
Filed Feb. 16, 1984, Ser. No. 580,973
Int. Cl.[4] H03K *21/38*
U.S. Cl. 377—107 **3 Claims**

1. The method of dividing a clock signal comprising, the steps of:

counting the clock signal cycles with a counter means and outputting a binary count indication on a plurality of signal leads;

monitoring the logic value of two of the binary count indication signal leads by directly connecting the same with respective J-K inputs of a J-K flip-flop; and

actuating the setting of the counter means to a given value with an output of the J-K flip-flop when a predetermined

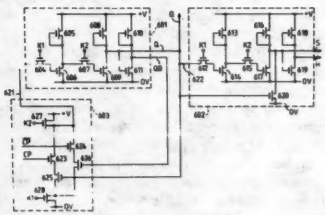


set of logic values are applied to said J-K inputs of said J-K flip-flop.

4,574,386
DYNAMICALLY OPERABLE TWO-PHASE LOGIC CIRCUITS

John R. Kinghorn, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1983, Ser. No. 491,510
Claims priority, application United Kingdom, May 12, 1982, 8213749
Int. Cl.[4] H03K *23/44*
U.S. Cl. 377—121 **6 Claims**

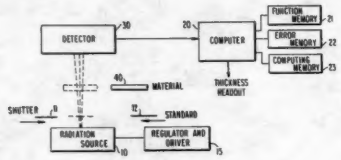


1. A dynamically operable two-phase circuit arrangement comprising first and second dynamic switching circuit, each of which has an input stage, a non-inverting output stage and an inverting output stage, each stage being responsive to either one of two possible logic levels at an input to produce the other logic level at an output, the input stage having its input connected to receive an input logic level by a first transfer stage controlled by first drive clock pulses of one phase, the non-inverting output stage having its input connected to receive the output logic level of the input stage by a second transfer stage controlled by second, substantially non-overlapping drive clock pulses of another phase, and the inverting output stage having its input connected to receive the output logic level of the non-inverting output stage, which circuit arrangement further comprises a combinatorial logic circuit which is operable under two-phase control by said first and second drive clock pulses and in response to applied counter clock pulses to cause the first dynamic switching circuit to perform a divide-by-two operation, and which circuit arrangement is characterized in that one of the output stages of the first dynamic switching circuit has its output connected to the input of the input stage of the second dynamic switching circuit and by a switching stage to the output of the corresponding output stage of the second dynamic switching circuit, the arrangement being such that at said latter output shift pulses having only one half the repetition frequency of the counter clock pulses are produced.

4,574,387
APPARATUS AND METHOD FOR MEASURING THICKNESS

Dominique Gignoux, Bethesda, and Russell Murray, Laurel, both of Md., assignors to Data Measurement Corporation, Gaithersburg, Md.

Filed Sep. 18, 1981, Ser. No. 303,574
Int. Cl.[4] G01N *23/16*; G01B *15/02*
U.S. Cl. 378—56 **8 Claims**



1. A radiation thickness gauge comprising:

a radiation source;

a radiation detector spaced from said source and located in the beam emitted by said source, said detector comprising means translating the intensity of the radiation received by the detector into an electrical signal output;

a first path extending through the space between said source and detector for the passage of a material whose thickness is to be measured;

a second path in said space, parallel to said first path, for introducing one of several standards of known thickness of reference material on demand;

shutter means of radiation absorbing material movable into said space to absorb the beam upon command;

means for recording several values of detector outputs corresponding to several combinations of standards, and computer means comprising means for determining a thickness function that best fits the relationship between the recorded values of standards thicknesses and corresponding detector outputs and recording said function as a relationship between thickness and detector output;

said computer means further comprising means for determining a value of thickness of the material to be measured by applying said thickness function to the detector output when the material whose thickness is to be measured is in the beam;

memory means for storing as errors the difference between the known thickness of each standard combination and the thickness obtained by calculation by applying said thickness function to the detector output obtained by placing said standard combination in the radiation beam; and

said computer means further comprising means for correcting detector outputs by:

1. calculating a thickness ratio as a function having as a numerator the known thickness of a standard combination minus the recorded error of said standard combination and having as a denominator the thickness as obtained by measuring the standard combination while using a previously stored thickness function; and

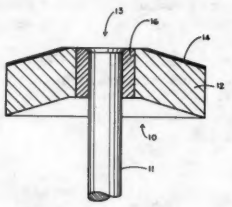
2. updating the thickness function by multiplying the previously stored function by said thickness ratio.

4,574,388
CORE FOR MOLYBDENUM ALLOY X-RAY ANODE SUBSTRATE

John H. Port, Solon; Dennis G. Kukoleck, Garfield Heights, and Robert M. Guezuraga, Chagrin Falls, all of Ohio, assignors to General Electric Company, Milwaukee, Wis.

Filed May 24, 1984, Ser. No. 613,489
Int. Cl.[4] H01J *35/10*; B23K *15/00, 19/00*
U.S. Cl. 378—144 **9 Claims**

5. A rotary anode assembly for attachment to an axial stem comprising a disc having an outer annulus composed of a first material which is not compatible with said stem for purposes of diffusion bonding, and an inner annulus attached to said outer annulus and having a central opening for receiving the axial

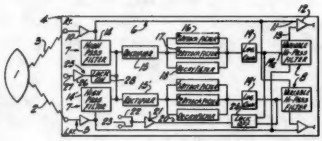


stem, said inner annulus being composed of a second material which is compatible with said stem for purposes of diffusion bonding.

4,574,389
STEREOPHONIC RECEIVER HAVING A NOISE REDUCTION CONTROL CIRCUIT

Larry Schotz, 118 Green Bay Rd., Thiensville, Wis. 53092

Filed Jul. 15, 1983, Ser. No. 514,034
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—10 **22 Claims**



1. A stereo signal receiver apparatus for receiving broadcast stereo sound signals including a left channel signal and a right channel signal and reproducing said received sound signals with noise reduction, comprising:

a left channel for transmitting the received left channel signal,

a right channel for transmitting the received right channel signal,

high frequency separation control means connected to the right and left channels for blending of the two signals in each of said channels, and

means to monitor the high frequency stereo signal content of each of said received signals and connected to said control means to control the separation in each channel in accordance with said high frequency signal content.

4,574,390
NOISE REDUCTION FOR STEREOPHONIC FM SIGNALS BY HIGH-SPEED SAMPLING AND LINEAR INTERPOLATION

Kazutoshi Hirohashi, Yokohama, and Yukinobu Ishigaki, Tokyo, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 26, 1984, Ser. No. 594,683
Claims priority, application Japan, Mar. 26, 1983, 58-50825; Mar. 31, 1983, 58-56430
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—13 **18 Claims**

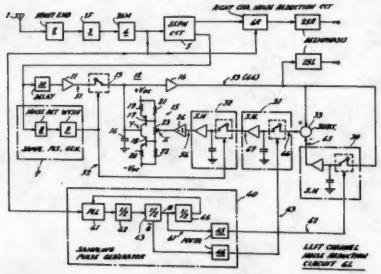
1. A noise reduction circuit for use with an FM receiver adapted to receive a composite stereophonic FM signal comprising a sum of left and right channel signals on a main channel, a difference between left and right channel signals on a subcarrier channel, a pilot signal and the sidebands of a suppressed subcarrier which is twice the frequency of said pilot signal and modulated by said difference, said receiver includ-

ing a demodulator for demodulating said composite FM signal, comprising:

noise detecting means for detecting an impulse noise in the demodulated signal;

first means responsive to the output of said noise detecting means for sampling said demodulated signal immediately prior to the occurrence of said noise;

second means for sampling said demodulated signal at a frequency twice the frequency of said pilot signal;



third means responsive to the outputs of said first and second means for generating a signal representing the slope ratio of said demodulated signal sampled by said first means; and

fourth means for linearly integrating said slope ratio signal to generate a linearly varying signal and combining same with the demodulated signal sampled by said first means.

4,574,391
STEREOPHONIC SOUND PRODUCING APPARATUS FOR A GAME MACHINE

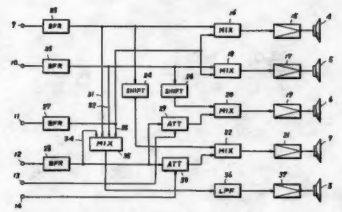
Masaharu Morishima, Nara, Japan, assignor to Funai Electric Company Limited, Osaka, Japan

Filed Oct. 27, 1983, Ser. No. 545,855

Claims priority, application Japan, Aug. 22, 1983, 58-154325

Int. Cl.[4] H04R 5/00

U.S. Cl. 381—18 **7 Claims**



1. A stereophonic sound producing apparatus for a game machine, comprising a left-hand and a right-hand background sound input terminals which receive signals from a first signal source; front and rear game sound input terminals receiving signals from a second signal source; left-hand and right-hand control signal input terminal receiving control signals from said second signal source; and first, second, third and fourth loudspeakers disposed at a forwardly right-hand side, a forwardly left side, a rearwardly right-hand side, and a rearwardly left side with respect to a seat disposed generally at a center portion of a game machine body, each loudspeaker being connected at respective precedent stages thereof to first, second, third, and fourth power amplifiers and to first, second, third and fourth mixers, respectively; said right-hand background sound input terminal being connected to said first mixer and to said fourth mixer through a first phase shifter, said left-hand background input terminal being connected to said second mixer and to said third mixer through a second phase shifter; one of said front and said rear game sound input terminals being connected to said first and said second mixers, the other one of front and said rear game sound input being connected to each of said third and said fourth mixers separately through respective first and second variable gain controllers; said left-hand and said right-hand control signal input terminals being connected to respective ones of said first and said second variable gain controllers respectively, such that sterophonic sounds are obtained by logical signals supplied from said left-hand and right-hand control signal input terminals.

4,574,392
ARRANGEMENT FOR THE TRANSMISSION OF SPEECH ACCORDING TO THE CHANNEL VOCODER PRINCIPLE

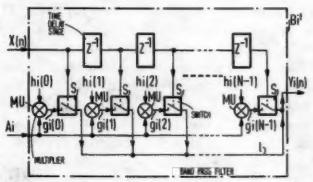
Ruediger Reiss, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,958

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137679

Int. Cl.[4] G10L 1/00

U.S. Cl. 381—51 **4 Claims**



1. A speech synthesizer for receiving and converting digital sum signals transmitted in successive frames into speech, each digital sum signal comprising a plurality of envelope value signals of speech for a plurality of spectral channels which differ as a result of frequency position and width and at least one parameter value signal of a speech-associated parameter assigned to a respective channel, said synthesizer comprising:

dividing means for dividing the digital sum signal into its envelope and parameter value signals;

pulse generating means connected to said dividing means to receive a parameter value signal and operable to produce pulses as excitation pulses; and

a time-variant finite pulse response filter bank connected to said pulse generating means to receive excitation pulses and to said dividing means to receive said envelope value signals, said filter bank including coefficient inputs to receive filter bank weighting coefficients and multiplication means for multiplying said coefficients with the envelope values in the rhythm of the successive frames, said filter bank comprising

a plurality of multipliers each including a first input means connected to receive a respective envelope value signal, a second input means connected to receive a weighting coefficient and output means,

an output line constituting the filter bank output,

an excitation line having a maximum of N taps, said excitation line connected to said pulse generating means,

a plurality of N−1 time delay circuits separately interposed in said excitation line between the first and the N−1 tap, and

a plurality of switches each connected between a respective multiplier output means and said output line, and each comprising a control input connected to a respective tap,

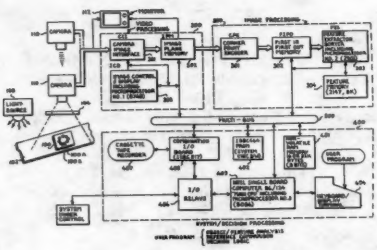
whereby the totality of the filter coefficients fix the filter response.

4,574,393

GRAY SCALE IMAGE PROCESSOR

George F. Blackwell, 4809 Bear Rd., and Harold W. Tomlinson, Jr., 4020 Bay Park Dr., both of Liverpool, N.Y. 13088

Filed Apr. 14, 1983, Ser. No. 485,051
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—17 **7 Claims**



1. A visual image processing method for digitally processing an electronic monochrome video image of an object within a predefined field of view so as to automatically identify the color of the object, said method comprising the steps of:

converting a predetermined visual field of view to a sequence of digital electronic video signals each of which represents the gray scale intensity of a corresponding elemental picture element of a two dimensional view of such a visual field of view;

constructing a histogram of the frequency of occurrency of the gray scale intensity values over the field of view;

eliminating from the histogram gray scale values not associated with reflections attributable to the color of the object;

computing an average gray scale value for the object as a function of the remaining gray scale values in the histogram; and

comparing the average gray scale value for the object to predetermined gray scale values for known colors to thereby identify the color of the object.

4,574,394

PIPELINE PROCESSOR

Wlodzimierz Holsztynski, and Stephen S. Wilson, both of Ann Arbor, Mich., assignors to Environmental Research Institute of MI, Ann Arbor, Mich.

Continuation of Ser. No. 269,143, Jun. 1, 1981, Pat. No. 4,524,455. This application Apr. 10, 1984, Ser. No. 598,724
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **9 Claims**

1. A system for processing spacially oriented data represented as a matrix comprising a plurality of lines of data words, the system comprising:

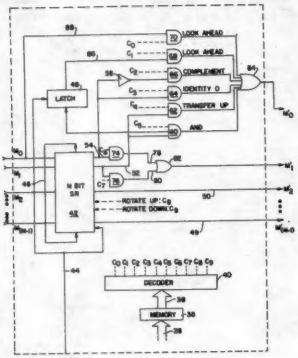
a plurality of interconnected processing cells, each processing cell being adapted to sequentially process each of the data words in a stream of data corresponding to one of the plurality of lines of data words respectively in parallel with the other interconnected processing cells, each of the processing cells comprising:

(1) a memory for storing a single data word in the sequence, the memory having data inputs, data outputs, and a control input,

(2) first means for accessing data corresponding to data words either preceding or subsequent to the single data word in the sequence,

(3) data inputs operably coupled with data outputs from an interconnected processing cell,

(4) data outputs operably coupled with data inputs from an interconnected processing cell, and



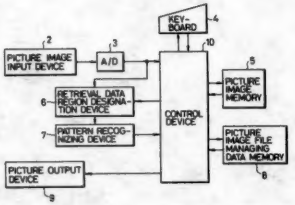
(5) logic means for generating an output as a preselected function of the data corresponding to the single data word stored in memory, data accessed by said first means, and data provided from the data inputs coupled with data outputs from an interconnected processing cell.

4,574,395

PICTURE IMAGE FILING APPARATUS

Hiroshi Kato, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,169
Claims priority, application Japan, Jan. 14, 1983, 58-3412
Int. Cl.[4] G06K *9/00;* **G06F** *7/10*
U.S. Cl. 382—61 **7 Claims**



1. A picture image filing apparatus, comprising: reading means for optically reading an original document to generate image data representing an image on said document;

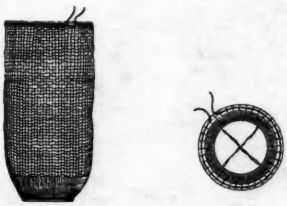
selection means for selecting, from said image data, at least one retrieval data signal representing said retrieval data, said selection means comprising means for detecting selection data among said image data, means responsive to said selection data for generating a selection signal indicating a particular image area containing said retrieval data, and means responsive to said selection signal for selecting said retrieval data signals from said image data; and

storage means for storing said image data together with retrieval data for use in later retrieving said image data from said storage means.

DESIGNS

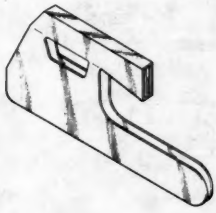
MARCH 4, 1986

282,788
NET FOR PROTECTION AGAINST INSECTS
Erik Svanberg, Östersund, Sweden, assignor to Strumpfabriken Vinetta Aktiebolag, Östersund, Sweden
Filed Sep. 1, 1983, Ser. No. 528,571
Claims priority, application Sweden, Mar. 1, 1983, 83-0572
Term of patent 14 years
U.S. Cl. D8—1

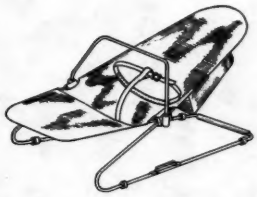


282,789
BLACK BELT
Kerdall Remboldt, 628 St. Andrew, Rapid City, S. Dak. 57701
Filed Feb. 10, 1982, Ser. No. 347,630
Term of patent 14 years
U.S. Cl. D2—380

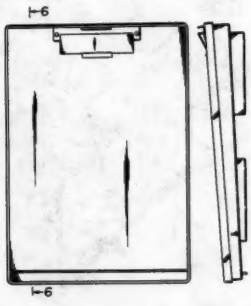
282,790
MERCHANDISE HANGER
Janusz Morawski, P.O. Box 562, Postal Station P, Toronto, Canada (M5S 2R1)
Filed Sep. 19, 1983, Ser. No. 533,930
Term of patent 14 years
U.S. Cl. D6—327



282,791
INFANT SEAT
William Lockett, III, 9902 W. Layton Ave., Littleton, Colo. 80123, and Edward D. Oliver, Manchester, N.H., assignors to William Lockett, III, Littleton, Colo.
Filed Aug. 10, 1983, Ser. No. 521,744
Term of patent 14 years
U.S. Cl. D6—333

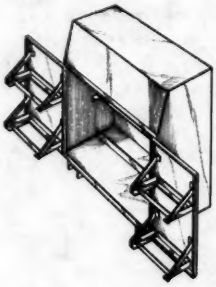


282,792
PORTABLE DESK
Benson Zinbarg, 11 Chestnut Hill La., Stamford, Conn. 06903
Filed Oct. 28, 1983, Ser. No. 546,575
Term of patent 14 years
U.S. Cl. D6—406

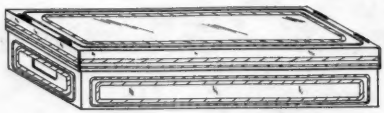


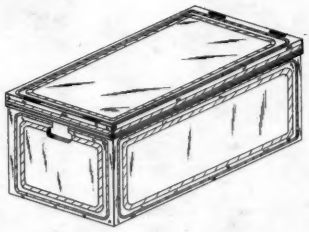
282,793
SUPPORT STAND FOR MOPS, TOWELS OR SIMILAR ARTICLE
Helen Zombeck, R.D. 1, Box 262-F, Lambertville, N.J. 08530
Filed Aug. 5, 1983, Ser. No. 520,588
Term of patent 14 years
U.S. Cl. D6—411

282,794
BATTERY STORAGE CABINET
Iiya Katsman, Bloomfield, N.J., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Nov. 25, 1983, Ser. No. 555,197
Term of patent 14 years
U.S. Cl. D6—432

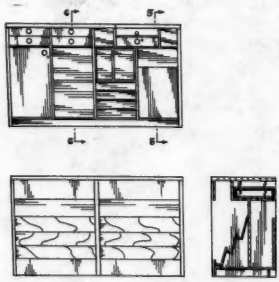


282,795
CHEST
Mark Densen, 18 Blackburn Pl., Summit, N.J. 07901
Filed Sep. 23, 1983, Ser. No. 535,246
Term of patent 14 years
U.S. Cl. D6—440



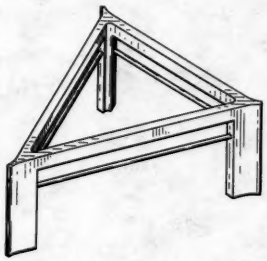


282,796
REGISTER COUNTER
Ronald J. Hoffman, San Rafael; Douglas Alsir, Long Beach; Robin S. LaFleur, Sausalito, and Claude Salzberger, San Franciso, all of Calif., assignors to ComputerLand Corporation, Hayward, Calif.
Filed Dec. 23, 1982, Ser. No. 452,752
Term of patent 14 years
U.S. Cl. D6—445



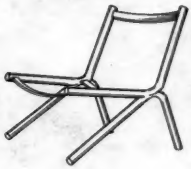
282,797
DISPLAY STAND
Linda H. Dixon, 1221 Andersen Dr., San Rafael, Calif. 94901
Filed Oct. 24, 1983, Ser. No. 544,667
Term of patent 14 years
U.S. Cl. D6—465

282,798
TABLE BASE
William Doezema, Grand Rapids, Mich., assignor to Baker, Knapp & Tubbs, Inc., Chicago, Ill.
Filed Oct. 18, 1983, Ser. No. 543,187
Term of patent 14 years
U.S. Cl. D6—495

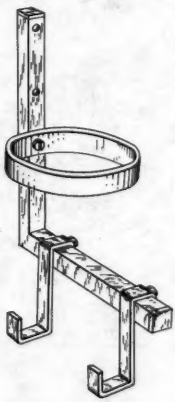


282,799
TABLE BASE
William Doezema, Grand Rapids, Mich., assignor to Baker, Knapp & Tubbs, Inc., Chicago, Ill.
Filed Oct. 18, 1983, Ser. No. 543,189
Term of patent 14 years
U.S. Cl. D6—495

282,800
FRAME FOR A CHAIR
Kurt H. Sorensen, 22 Rhyndarra St., Yeronga, Q. 4104, Australia
Filed May 24, 1983, Ser. No. 497,674
Claims priority, application Australia, Nov. 24, 1982, 2207/82
Term of patent 14 years
U.S. Cl. D6—500

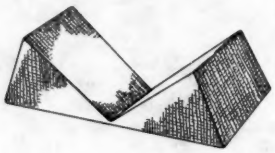


282,801
STORAGE BRACKET FOR A CHAIN SAW
Douglas E. Goins, Rte. 4, Box 337, and Johnny E. Rhodes, 623 N. Poplar St., both of Lincolnton, N.C. 28092
Filed Jul. 29, 1983, Ser. No. 518,401
Term of patent 14 years
U.S. Cl. D6—553

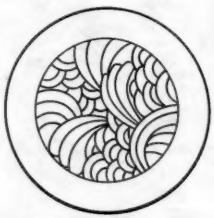


282,802
HEAD REST
Roy Righini, 12 Tillock St., Thornleigh, New South Wales, Australia
Filed Jul. 15, 1983, Ser. No. 514,288
Claims priority, application Australia, Jan. 17, 1983, 2671/83
Term of patent 14 years
U.S. Cl. D6—596

282,803
HEAD REST
Roy Righini, 12 Tillock St.,, Thornleigh, New South Wales, Australia
Filed Jul. 15, 1983, Ser. No. 514,329
Claims priority, application Australia, Jan. 17, 1983, 2670/83
Term of patent 14 years
U.S. Cl. D6—596



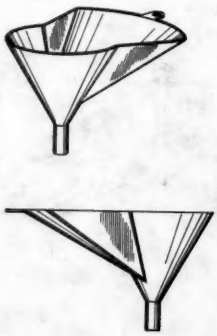
282,804
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 24, 1983, Ser. No. 478,638
Term of patent 14 years
U.S. Cl. D7—23



282,805
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,089
Term of patent 14 years
U.S. Cl. D7—25

282,806
DECAL FOR A PLATE OF SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 22, 1983, Ser. No. 477,849
Term of patent 14 years
U.S. Cl. D7—39

282,807
GUARD FUNNEL
Patricia W. Hasse, 2608 Crown Crest La., La Jolla, Calif. 92037
Filed Mar. 2, 1984, Ser. No. 538,155
Term of patent 14 years
U.S. Cl. D7—68



282,808

FOOD STORAGE CONTAINER OR THE LIKE

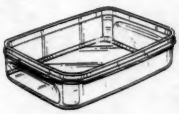
Robert H. C. M. Daenen, Hekelgem, Belgium, and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Northbrook, Ill.

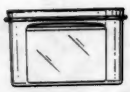
Filed Aug. 10, 1982, Ser. No. 406,847

The portion of the term of this patent subsequent to Aug. 6, 1999, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—79





282,809

FOOD STORAGE CONTAINER OR THE LIKE

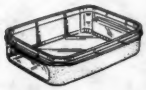
Robert H. C. M. Daenen, Hekelgem, Belgium, and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Northbrook, Ill.

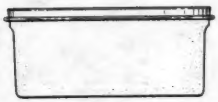
Filed Aug. 10, 1982, Ser. No. 406,848

The portion of the term of this patent subsequent to Aug. 6, 1999, has been disclaimed.

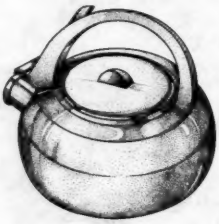
Term of patent 14 years

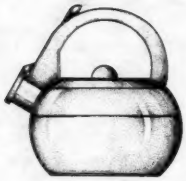
U.S. Cl. D7—79

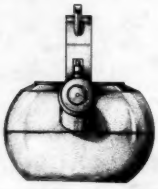




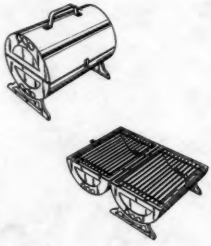
282,810
TEA KETTLE OR SIMILAR ARTICLE
Joy C. Urich, New York, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Aug. 11, 1983, Ser. No. 522,098
Term of patent 14 years
U.S. Cl. D7—322







282,811
PORTABLE BARBECUE
Lillian C. Best, 9831 Foster Rd., Downey, Calif. 90242
Filed Apr. 29, 1983, Ser. No. 490,050
Term of patent 14 years
U.S. Cl. D7—332

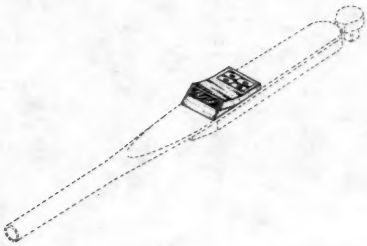


282,812
COMBINED HANDLE AND ADAPTER FERRULE WITH TIGHTENING KNOB FOR GARDENING IMPLEMENTS
Franco Clivio, Ulm, and Dieter Raffler, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 17, 1983, Ser. No. 467,389
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, GRAIII13548203
Term of patent 14 years
U.S. Cl. D8—1

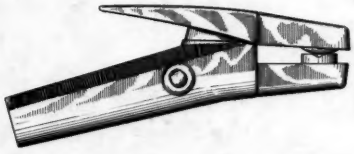
282,813
BENDER BOARD HOLDER
R. Warner Tappan, and Pam R. Tappan, both of 27265 Calle Anejo, Capistrano Beach, Calif. 92624
Filed Nov. 28, 1983, Ser. No. 555,826
Term of patent 14 years
U.S. Cl. D8—1

282,814
FREEZE PLUG TOOL
Maynard L. Smith, P.O. Box 90804, San Diego, Calif. 92109
Filed Feb. 9, 1983, Ser. No. 465,304
Term of patent 14 years
U.S. Cl. D8—14

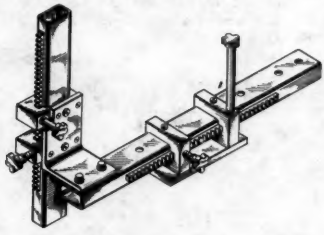
282,815
TORQUE TOOL READOUT UNIT
Bosko Grabovac, Arcadia, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.
Filed Jan. 20, 1983, Ser. No. 449,476
Term of patent 14 years
U.S. Cl. D8—24



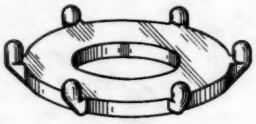
282,816
AIR CARBON-ARC CUTTING AND GOUGING TORCH
David B. Chaney, Columbus, and Michael J. Duwell, Cincinnati, both of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Aug. 8, 1983, Ser. No. 521,204
Term of patent 14 years
U.S. Cl. D8—30



282,817
POSITIONER TO SUPPORT A GAS CUTTING TORCH, A WELDING TORCH OR THE LIKE
David E. Johnson, Pataskala, and Kenneth E. McCall, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Mar. 2, 1983, Ser. No. 471,390
Term of patent 14 years
U.S. Cl. D8—71

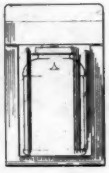


282,818
LOCKING RING FOR MEAT CASINGS OR THE LIKE
Arnoldus J. B. M. Bos, Zolder, Belgium, assignor to International Chemical Engineering Estab., Vaduz, Liechtenstein
Filed Jan. 18, 1983, Ser. No. 458,917
Term of patent 14 years
U.S. Cl. D8—394

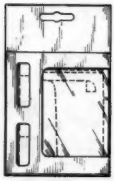


282,819
PACKAGING CONTAINER
Andre Laurent, and Daniel Charron, both Montreal, Canada, assignors to Promotions Jean-Rene Inc., Montreal, Canada
Filed Apr. 27, 1984, Ser. No. 604,584
Term of patent 14 years
U.S. Cl. D9—314

282,820
PACKAGED BOTTLE OF PILLS
Paul Carelli, 94 Chapel Hill Ter., Kinnelon, N.J. 07405
Filed Aug. 18, 1983, Ser. No. 524,384
Term of patent 14 years
U.S. Cl. D9—337

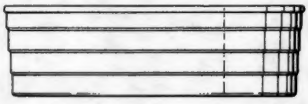


282,821
DISPLAY PACKAGE
Androus D. Noyes, Ossining, N.Y., assignor to Duracell Inc., Bethel, Conn.
Filed Apr. 1, 1983, Ser. No. 481,221
Term of patent 14 years
U.S. Cl. D9—415



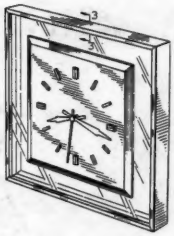
282,822
COMBINED PACKAGING AND DISPLAY CONTAINER FOR A FLASHLIGHT
Androus D. Noyes, Ossining, N.Y., assignor to Duracell Inc., Bethel, Conn.
Filed Apr. 1, 1983, Ser. No. 481,417
Term of patent 14 years
U.S. Cl. D9—415

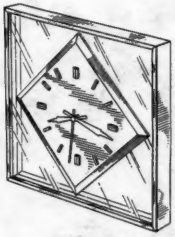
282,823
COMBINED TRAY AND LID
Jozef T. Franek, Chorleywood, and Paul Porucznik, St. Alban's, both of England, assignors to Metal Box, plc, England
Filed Oct. 4, 1982, Ser. No. 432,425
Term of patent 14 years
U.S. Cl. D9—429

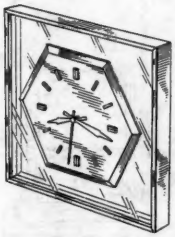


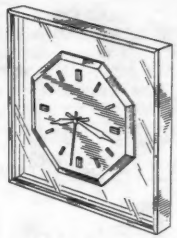
282,824
TRAY
Jozef T. Franek, Chorleywood, and Paul Porucznik, St. Alban's, both of England, assignors to Metal Box plc, England
Filed Oct. 4, 1982, Ser. No. 432,424
Claims priority, application United Kingdom, Apr. 27, 1982, 1006390
Term of patent 14 years
U.S. Cl. D9—429

282,825
CLOCK
Ari Kostios, Downsview, Canada, assignor to Aristo Designart Inc., Downsview, Canada
Division of Ser. No. 358,415, Mar. 15, 1982, Pat. No. Des. 276,982. This application Sep. 7, 1984, Ser. No. 648,408
Claims priority, application Canada, Sep. 16, 1981, 16-09-81-10
Term of patent 14 years
U.S. Cl. D10—25

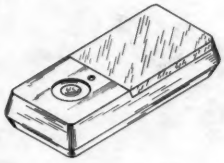




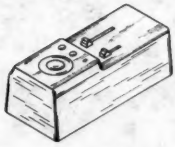




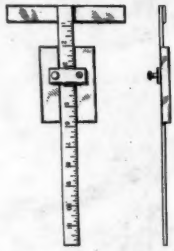
282,826
PROGRAMMABLE LIGHT TIMING SWITCH
Richard L. Hoogner, Sunnyvale, Calif., assignor to Security Switch Ltd., San Ramon, Calif.
Filed Mar. 28, 1983, Ser. No. 479,374
Term of patent 14 years
U.S. Cl. D10—40



282,827
PROGRAMMABLE LIGHT TIMING SWITCH FOR MOUNTING ON AN ELECTRICAL OUTLET
Richard L. Hoogner, Sunnyvale, Calif., assignor to Security Switch Ltd., San Ramon, Calif.
Filed Mar. 29, 1983, Ser. No. 479,383
Term of patent 14 years
U.S. Cl. D10—40



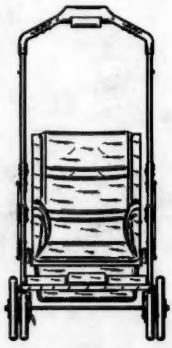
282,828
MAT MARKING DEVICE OR SIMILAR ARTICLE
Howard M. Holder, 28794 Bradley Rd., Sun City, Calif. 92381
Filed Nov. 28, 1983, Ser. No. 555,894
Term of patent 14 years
U.S. Cl. D10—62



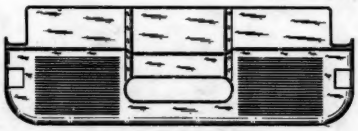
282,829
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation S.A., Vaduz, Liechtenstein
Filed Dec. 16, 1983, Ser. No. 562,215
Claims priority, application Greece, Jun. 17, 1983, 358968/83
Term of patent 14 years
U.S. Cl. D11—75

282,830
MOTORCAR
Hiroshi Zaima, Wako, and Yusuke Saitoh, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 7, 1988, Ser. No. 472,625
Claims priority, application Japan, Sep. 8, 1982, 57-40704
Term of patent 14 years
U.S. Cl. D12—91

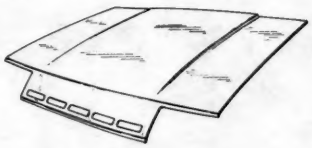
282,831
STROLLER
James M. Kain, Tipp City, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Oct. 28, 1983, Ser. No. 546,624
Term of patent 14 years
U.S. Cl. D12—129



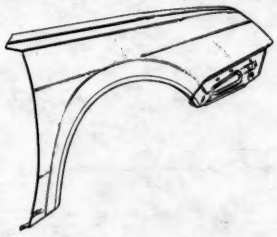
282,832
STROLLER FOOT REST
James M. Kain, Tipp City, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Oct. 28, 1983, Ser. No. 546,767
Term of patent 14 years
U.S. Cl. D12—133



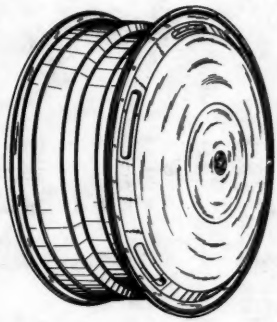
282,833
AUTOMOBILE HOOD
Shinken Tanaka, Hatano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 8, 1983, Ser. No. 483,299
Term of patent 14 years
U.S. Cl. D12—173



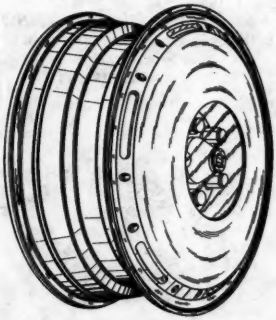
282,834
AUTOMOBILE FRONT FENDER
Takayasu Matsui, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 8, 1983, Ser. No. 483,298
Term of patent 14 years
U.S. Cl. D12—184



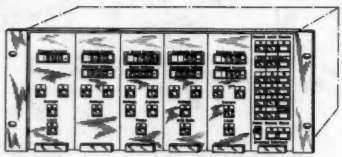
282,835
VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Apr. 14, 1983, Ser. No. 485,139
Term of patent 14 years
U.S. Cl. D12—209



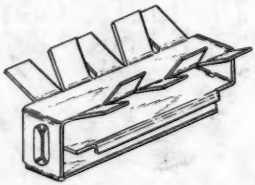
282,836
VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Apr. 14, 1983, Ser. No. 485,140
Term of patent 14 years
U.S. Cl. D12—209



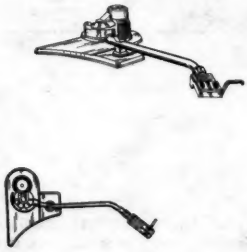
282,837
ION SOURCE CONTROL PANEL
Gary E. Thornton, Ft. Collins; Robert A. Zarren, Boulder, and R. Larry Choate, Loveland, all of Colo., assignors to Ion Tech, Inc., Ft. Collins, Colo.
Filed Sep. 9, 1983, Ser. No. 530,625
Term of patent 14 years
U.S. Cl. D13—12



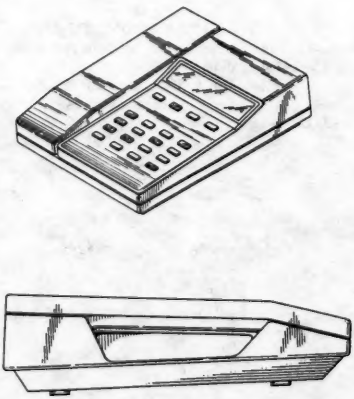
282,838
SLIP-ON HEAT SINK FOR ENCASED ELECTRICAL PACKAGES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 25, 1983, Ser. No. 478,919
The portion of the term of this patent subsequent to Oct. 2, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—23



282,839
TONE ARM
Vladimir F. Vinogradov, ulitsa Gorkogo, 135, kv. 17; Juris Z. Dreimanis, ulitsa Vangazhu, 32, kv. 16; Aivars A. Kruklis, ulitsa Kirova, 27, and Dzintars A. Kave, ulitsa Raunas, 45, korpus 5, Kv. 208, all of Riga, U.S.S.R.
Filed Apr. 20, 1982, Ser. No. 370,073
Claims priority, application U.S.S.R., Apr. 4, 1980, 21582
Term of patent 14 years
U.S. Cl. D14—27

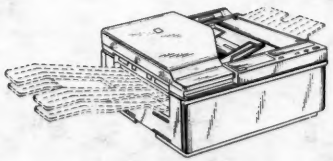


282,840
TELEPHONE
Eric J. Marshall, London, United Kingdom, assignor to The Marshall Telephone Corporation Limited, United Kingdom
Filed Dec. 9, 1983, Ser. No. 559,698
Claims priority, application United Kingdom, Jun. 3, 1983, 1013504
Term of patent 14 years
U.S. Cl. D14—53



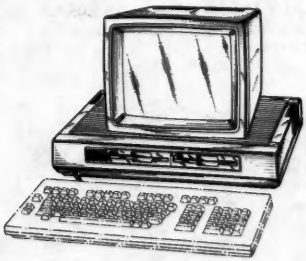
282,841
KEY TELEPHONE SET
Hiroshi Inaba, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan
Filed Jul. 11, 1983, Ser. No. 512,367
Claims priority, application Japan, Feb. 1, 1983, 58-3331
Term of patent 14 years
U.S. Cl. D14—58

282,842
FACSIMILE TRANSCEIVER
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 18, 1983, Ser. No. 543,035
Claims priority, application Japan, Apr. 25, 1983, 58-17439
Term of patent 14 years
U.S. Cl. D14—94

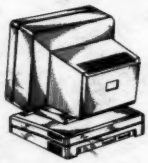


282,843
PORTABLE ELECTRONIC COMPUTER
Masaki Kurihara, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of Japan
Filed May 19, 1983, Ser. No. 496,342
Claims priority, application Japan, Nov. 22, 1982, 57-52659
Term of patent 14 years
U.S. Cl. D14—100

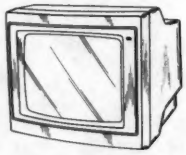
282,844
PERSONAL COMPUTER
Kenji Ekuan, Tokyo, Japan, assignor to Epson Corporation, Tokyo, Japan
Filed Mar. 17, 1983, Ser. No. 476,308
Claims priority, application Japan, Sep. 17, 1982, 57-42532
Term of patent 14 years
U.S. Cl. D14—106



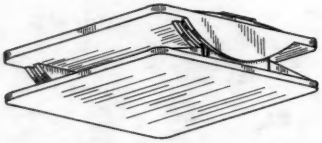
282,845
VIDEO TERMINAL
Barbara K. Lewis, Sunnyvale, Calif., assignor to Qume Corporation, San Jose, Calif.
Filed Apr. 12, 1983, Ser. No. 484,135
Term of patent 14 years
U.S. Cl. D14—113



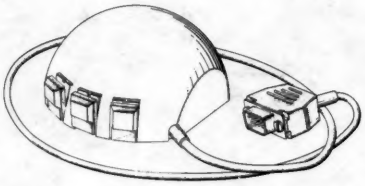
282,846
COMPUTER DISPLAY
Kazuyuki Tsuburaya, Akikawa; Takanori Nishiyama, Koganei, and Kazunori Yanagisawa, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 4, 1983, Ser. No. 520,516
Claims priority, application Japan, Feb. 10, 1983, 58-4862; Feb. 10, 1983, 58-4864
Term of patent 14 years
U.S. Cl. D14—113



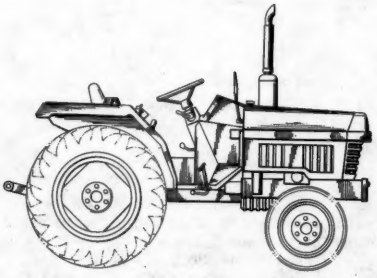
282,847
TILT AND ROTATE BASE FOR A DISPLAY MONITOR
Siebolt Hettinga, 8000 University Ave., Des Moines, Iowa 50311
Filed Jun. 20, 1983, Ser. No. 505,969
Term of patent 14 years
U.S. Cl. D14—114

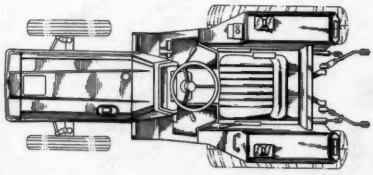


282,848
DEVICE TO FOLLOW LINES ON A DRAWING AND TO REGISTER THE ORDINATES OF GIVEN POINTS OF SAID DRAWING
Eric Depraz, Vaud, Switzerland, assignor to Depraz S.A., Vaud, Switzerland
Filed Jul. 20, 1983, Ser. No. 515,479
Claims priority, application Hague, Jan. 20, 1983, 72.879
Term of patent 14 years
U.S. Cl. D14—114

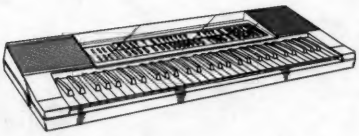


282,849
AGRICULTURAL TRACTOR
Genichi Funabashi, Sennan, Japan, assignor to Kubota, Ltd., Japan
Filed Sep. 16, 1983, Ser. No. 532,984
Claims priority, application Japan, Jun. 17, 1983, 58-26306
Term of patent 14 years
U.S. Cl. D15—23

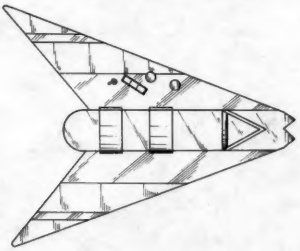




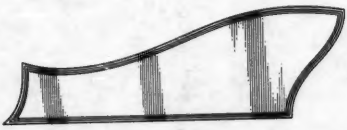
282,850
KEYBOARD MUSICAL INSTRUMENT OR SIMILAR ARTICLE
Masaru Futami, Fujisawa, Japan, assignor to Lowrey Industries, Inc., Deerfield, Ill.
Filed Jul. 28, 1983, Ser. No. 518,180
Claims priority, application Japan, Dec. 27, 1982, 57-58593
Term of patent 14 years
U.S. Cl. D17—1



282,851
GUITAR BODY
Angelo G. Tornese, 8521 Oakford Dr., Springfield, Va. 22152
Filed Aug. 3, 1982, Ser. No. 404,865
Term of patent 14 years
U.S. Cl. D17—18

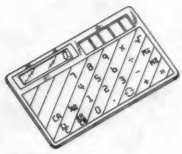


282,852
PICKGUARD FOR A GUITAR
James L. D'Aquisto, 3235 Manhassett, Greenport, N.Y. 11944
Filed Nov. 7, 1983, Ser. No. 549,674
Term of patent 14 years
U.S. Cl. D17—20



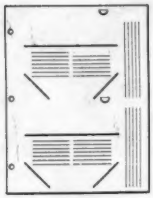
282,853
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko, and Osamu Murakami, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 557,934
Claims priority, application Japan, Jul. 25, 1983, 58-32620
Term of patent 14 years
U.S. Cl. D18—7

282,854
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko, and Yuji Harada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 557,939
Claims priority, application Japan, Jul. 7, 1983, 58-29605
Term of patent 14 years
U.S. Cl. D18—7

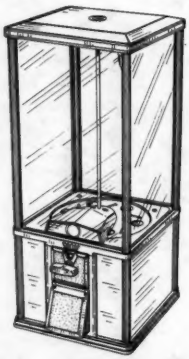


282,855
PAINTER'S CAP PRINTING ATTACHMENT FOR SILK SCREEN MACHINE OR THE LIKE
Roger L. Jennings, Glen Falls, N.Y., assignor to R. Jennings Manufacturing Co., Inc., Fort Ann, N.Y.
Filed Oct. 11, 1983, Ser. No. 540,753
Term of patent 14 years
U.S. Cl. D18—22

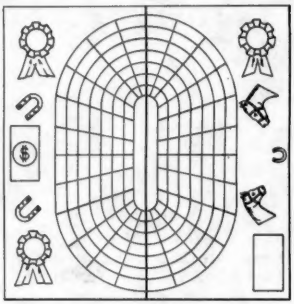
282,856
ALBUM PAGE FOR STORING COMPUTER DISKS OR SIMILAR ARTICLE
Douglas P. Daly, 115 Osborne Ave., Mamaroneck, N.Y. 10543
Filed Jul. 1, 1983, Ser. No. 510,960
Term of patent 14 years
U.S. Cl. D19—33



282,857
COIN OPERATED VENDING MACHINE
Joseph W. Schwarzli, 430 Comstock Rd., Scarborough, Ontario, Canada (M1L 2H6)
Filed Jul. 6, 1983, Ser. No. 511,187
Term of patent 14 years
U.S. Cl. D20—7



282,858
HORSE RACING GAMEBOARD
Jose M. G. Gonzales, 8520 Summer, Albuquerque, N. Mex. 87112
Filed Aug. 25, 1983, Ser. No. 526,651
Term of patent 14 years
U.S. Cl. D21—27

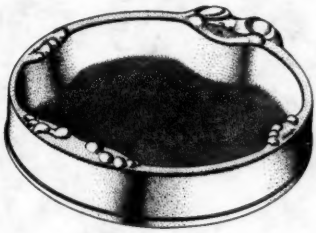


282,859
TOY RAKEHEAD
Nancy Burhop, 2412 Prospect St., Evanston, Ill. 60201
Filed Dec. 7, 1983, Ser. No. 558,832
Term of patent 14 years
U.S. Cl. D21—120

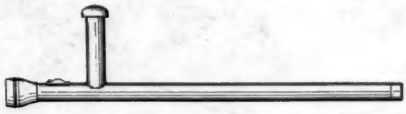
282,860
CHILD'S CLOWN FIGURE TOY
Peter G. Adams, East Grinstead, England, assignor to Hestair Kiddicraft Limited, Surrey, England
Filed Jun. 16, 1983, Ser. No. 505,066
Term of patent 14 years
U.S. Cl. D21—173

282,861
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Apr. 21, 1982, Ser. No. 370,209
Term of patent 14 years
U.S. Cl. D21—190

282,862
WADING POOL
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Jun. 8, 1983, Ser. No. 502,178
Term of patent 14 years
U.S. Cl. D21—252

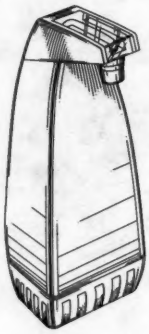


282,863
POLICE BATON
Charles R. Kashary, Jr., Brooklyn, Ohio, assignor to DKZ, Incorporated, Cleveland, Ohio
Filed Apr. 20, 1983, Ser. No. 486,852
Term of patent 14 years
U.S. Cl. D22—1

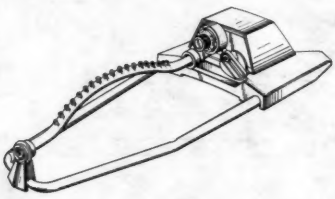


282,864
SEMIAUTOMATIC RIFLE
Robert A. Weaver, Escondido, Calif., assignor to Weaver Arms, Inc., Escondido, Calif.
Filed May 19, 1983, Ser. No. 496,266
Term of patent 14 years
U.S. Cl. D22—6

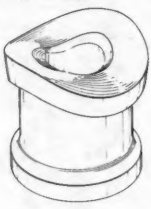
282,865
WATER FILTER
Raymond E. Ward, 1150 Anchorage La., LeRondelet, San Diego, Calif. 92106
Filed Oct. 3, 1983, Ser. No. 538,175
Term of patent 14 years
U.S. Cl. D23—4



282,866
LAWN SPRINKLER
Ronald G. Hayes, Batavia, Ohio, assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Apr. 20, 1984, Ser. No. 602,489
Term of patent 14 years
U.S. Cl. D23—8

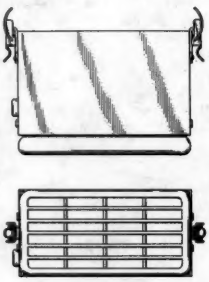


282,867
WELDING OUTLET
Bobby W. Ryan, Houston, and Glynn E. Woods, Kingwood, both of Tex., assignors to WFI International, Inc., Houston, Tex.
Filed Mar. 21, 1983, Ser. No. 475,262
Term of patent 14 years
U.S. Cl. D23—40

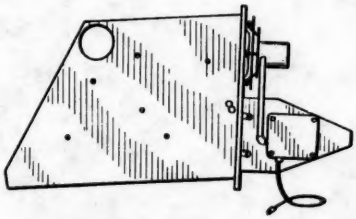


282,868
COMMODE CHAIR
Bob S. Shigenaka, 181 Tally Ho Rd., and John S. Figueiredo, P.O. Box Drawer 0, both of Arroyo Grande, Calif. 93420
Filed May 2, 1983, Ser. No. 490,520
Term of patent 14 years
U.S. Cl. D23—48

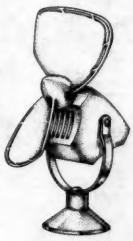
282,869
HOUSING FOR ELECTRIC HEATER ACCESSORY FOR A PORTABLE BLOWER
Clyde B. Parnell, Godwin, N.C., assignor to Fasco Industries, Inc., Boca Raton, Fla.
Filed Jan. 19, 1983, Ser. No. 459,046
Term of patent 14 years
U.S. Cl. D23—73



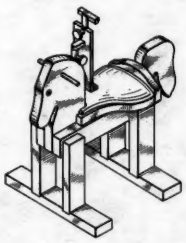
282,870
AIR-TO-AIR HEAT EXCHANGER
L. Benning; E. Novecosky, and D. Van Ee, all of Humboldt, Canada, assignors to Del-Air Systems Ltd., Humboldt, Canada
Filed Dec. 13, 1982, Ser. No. 448,930
Term of patent 14 years
U.S. Cl. D23—136



282,871
FAN
Frank Hutter, Shallow Lake, Canada, assignor to Caframo Limited, Wiarton, Canada
Filed Jan. 14, 1983, Ser. No. 458,043
Claims priority, application Canada, Jul. 16, 1982, 16-07-82-1
Term of patent 14 years
U.S. Cl. D23—158

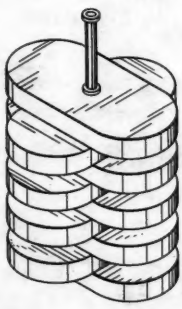


282,872
X-RAY FILM CASSETTE HOLDER FOR USE WITH CHILDREN
Dennis D. Hayes, 1127 Pillsbury, Lancaster, Calif. 93534, and Dean D. Hayes, 39727 Calle Lomite, Green Valley, Calif. 91350
Filed Sep. 22, 1983, Ser. No. 534,754
Term of patent 14 years
U.S. Cl. D24—2



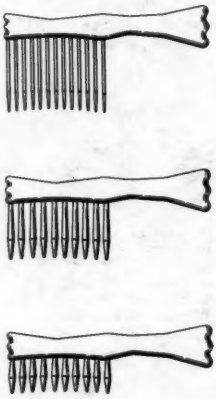
282,873
SPOTLIGHT
Richard L. May, Manhattan Beach, and Howard T. Ibaraki, Hacienda Heights, both of Calif., assignors to Mr. Gasket Company, Cleveland, Ohio
Filed Dec. 1, 1983, Ser. No. 557,056
Term of patent 14 years
U.S. Cl. D26—45

282,874
LAMP BASE
Sante G. Alessandro, New York, N.Y., assignor to Erwin-Lambeth, Inc., Thomasville, N.C.
Filed Mar. 25, 1983, Ser. No. 479,014
Term of patent 14 years
U.S. Cl. D26—93



282,875
HAIR PICK
Franklin D. Harvey, 22 E. Broad St., Richmond, Va. 23219
Filed Jul. 10, 1984, Ser. No. 629,404
Term of patent 14 years
U.S. Cl. D28—31

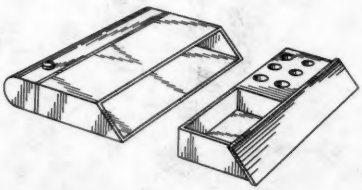
282,876
COMB
Franklin D. Harvey, 22 E. Broad St., Richmond, Va. 23219
Filed Jul. 10, 1984, Ser. No. 629,406
Term of patent 14 years
U.S. Cl. D28—31



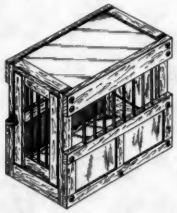
282,877
HAIR LIFT
Franklin D. Harvey, 22 E. Broad St., Richmond, Va. 23219
Filed Jul. 10, 1984, Ser. No. 629,412
Term of patent 14 years
U.S. Cl. D28—31

282,878
SHAVING RAZOR
Herbert M. Skidmore, 2208 Wheaton Dr., Norman, Okla. 73071
Filed Jan. 23, 1984, Ser. No. 573,011
Term of patent 14 years
U.S. Cl. D28—46

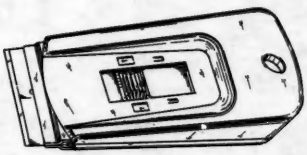
282,879
NAIL POLISH DRYER
Charlene A. Roberton, P.O. Box #1482, Oak Brook, Ill. 60521
Filed Aug. 4, 1983, Ser. No. 520,482
Term of patent 14 years
U.S. Cl. D28—58



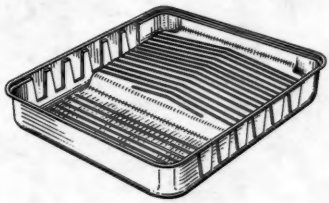
282,880
ANIMAL CRATE
Ronald E. Barati, Clifford Estates, R.D. 1, Ligonier, Pa. 15658
Filed Oct. 4, 1983, Ser. No. 539,077
Term of patent 14 years
U.S. Cl. D30—1



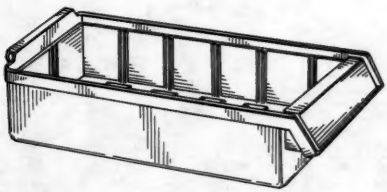
282,881
HAND SCRAPER TOOL
Donald Gringer, New York, N.Y., assignor to Allway Tools, Inc., Bronx, N.Y.
Filed Nov. 18, 1983, Ser. No. 553,251
Term of patent 14 years
U.S. Cl. D32—48



282,882
ROLLER COATER PAINT TRAY
Philip J. Allison, Renforth, and Morley L. Smith, Beaconsfield, both of Canada, assignors to T. S. Simms & Co. Limited, Saint John, Canada
Filed Mar. 10, 1983, Ser. No. 474,818
Claims priority, application Canada, Feb. 9, 1983, 09-02-83-3
Term of patent 14 years
U.S. Cl. D32—53.1



282,883
STORAGE BIN
Heikki Kiiski, Turku, Finland, assignor to Treston Oy, Turku, Finland
Filed Feb. 25, 1983, Ser. No. 469,987
Claims priority, application Finland, Aug. 31, 1982, 740/82; Aug. 31, 1982, 742/82
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & O Engineering, Inc.: *See—*
Orphall, Axel W.; and Albers, Bernd G., 4,573,643, Cl. 241-189.00R.

A/S Alfred Benzon: *See—*
Roswall, Stig; and Thorhus, Lene B., 4,574,080, Cl. 424-20.000.

A/S Kongsberg Vapenfabrikk: *See—*
Stroem, Sigmunn, 4,573,315, Cl. 60-39.370.
Stroem, Sigmunn; and Mowill, Rolf J., 4,573,868, Cl. 415-157.000.

Abe, Ken-ichi; and Ozaki, Ryoji, to Fuji Electric Co., Ltd. Multi-polar circuit breaker. 4,574,170, Cl. 200-153.00G.

Abe, Michio, to Tokai TRW & Co., Ltd. Rack-pinion steering gear and method for cutting rack teeth. 4,573,372, Cl. 74-422.000.

Abel, Kent W.: *See—*
Kloehn, Kurt J.; Rajala, Gregory J.; and Abel, Kent W., 4,573,382, Cl. 83-53.000.

Abramson, Robert D.; Donovan, David A.; and Field, Nathaniel L., to Ford Motor Company. Angular positioning actuator. 4,573,348, Cl. 73-118.000.

Adachi, Keiichi; Ikeda, Tadashi; and Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive materials having a layer of grains having dye absorbed thereon. 4,574,115, Cl. 430-522.000.

Adams, Brian W., to Lawrence, Peter Robin Broughton. Amine salts and products containing them. 4,574,151, Cl. 536-31.000.

Adams, John F. E.; Proffit, Philip J. G.; Oakley, Nicholas R.; and Folland, Rickworth, to Metal Box p.l.c. Containers. 4,573,597, Cl. 215-12.00R.

Adams, Jurgen; and Scholl, Hans-Peter, to Kienzle Apparate GmbH. Taximeter assembly. 4,574,189, Cl. 235-30.00R.

Adell, Robert, to U.S. Product Development Company. Magnetic door edge guard. 4,573,288, Cl. 49-462.000.

Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG: *See—*
Feurer-Zogel, Rudolf; and Vogler, Rudolf, 4,573,279, Cl. 36-35.00R.

Advanced Cardiovascular Systems, Inc.: *See—*
Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,573,470, Cl. 128-344.000.

Advanced Parallel Systems, Inc.: *See—*
Konesky, Gregory A., 4,574,345, Cl. 364-200.000.

Ahola, Reijo, to Oy Noki AB. Digital multiplex device. 4,574,373, Cl. 370-58.000.

Aichi Steel Works, Ltd.: *See—*
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,574,016, Cl. 148-144.000.

Aikawa, Kunihiko: *See—*
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,573,546, Cl. 180-89.100.

Aishima, Takanori; Utsumi, Makoto; and Ezaki, Yoshihiro, to Idemitsu Petrochemical Co., Ltd. Multi-layer film. 4,574,104, Cl. 428-220.000.

Aker Oil Tools, Inc.: *See—*
Reinhardt, Paul A., 4,573,529, Cl. 166-68.000.

Akers, Michael J.: *See—*
Hargrove, William W.; Harris, Dale C.; Akers, Michael J.; and Sperry, Charles R., 4,573,967, Cl. 604-56.000.

AKT Consultants Pty, Limited: *See—*
Ruiz-Avila, Jose L., 4,573,278, Cl. 34-168.000.

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Andreasson, Bo C., 4,573,556, Cl. 188-137.000.

Aktiebolaget IRO: *See—*
Hellstrom, Jerker; Tholander, Lars H. G.; and Jacobsson, Kurt A. G., 4,574,353, Cl. 364-470.000.

Akutagawa, Hitoshi, to Mazda Motor Corporation. Auxiliary power transmission having synchronizing mechanism. 4,573,371, Cl. 74-339.000.

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Donovan, James G., 4,574,105, Cl. 428-233.000.

Albers, Bernd G.: *See—*
Orphall, Axel W.; and Albers, Bernd G., 4,573,643, Cl. 241-189.00R.

Albert, Hans. Method apparatus of measuring axial parallelism of roller pairs. 4,573,274, Cl. 33-182.000.

Alberta Oil Sands Technology and Research Authority: *See—*
Wan, Jeffrey K. S., 4,574,038, Cl. 204-162.00R.

Albritton, Charles W.; Powis, William N.; and Graham, William M., to ITT Corporation. Space heater. 4,573,912, Cl. 432-222.000.

Aldridge, Donald J. Knot tying apparatus. 4,573,719, Cl. 289-17.000.

Alfatechnic AG: *See—*
Dubach, Werner F., 4,573,600, Cl. 215-237.000.

Allen, Dell K. Sheet lifter for a loose leaf binder. 4,573,822, Cl. 402-80.00L.

Allen, James L.: *See—*
Barmatz, Martin B.; Allen, James L.; and Gaspar, Mark S., 4,573,356, Cl. 73-505.000.

Allied Corporation: *See—*
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,573,630, Cl. 228-263.180.
Boyle, William J., Jr.; Mares, Frank; and Wallo, Andrea M., 4,574,060, Cl. 558-457.000.
Deem, Brian C.; and Hall, John L., 4,573,561, Cl. 192-91.00A.
Prendergast, Ian D., 4,573,664, Cl. 266-44.000.
Ritsema, Irving R., 4,573,554, Cl. 188-73.380.
Wang, Der-Shi, 4,573,558, Cl. 188-268.000.

Allis-Chalmers Corporation: *See—*
Mayo, Howard A., Jr., 4,573,827, Cl. 405-78.000.

Alma Products Company: *See—*
DeLand, Daniel L., 4,573,562, Cl. 192-106.200.

Aloka Co., Ltd.: *See—*
Namekawa, Koroku; Koyano, Akira; and Kasai, Chihiro, 4,573,477, Cl. 128-663.000.

Alpha Molding Technologies Associates: *See—*
Smith, Lyle, 4,573,900, Cl. 425-157.000.

Alps Electric Co., Ltd.: *See—*
Kobayashi, Kazuo, 4,573,368, Cl. 74-108.000.
Kondo, Yoshihisa, 4,573,812, Cl. 400-121.000.
Ohyama, Toru; and Nomura, Takao, 4,574,201, Cl. 307-243.000.

Aluminum Pechiney: *See—*
Cristol, Benoit; and Mordini, Jacques, 4,574,074, Cl. 423-124.000.

ALZA Corporation: *See—*
Chen, Yu-Ling; Chun, Leslie L.; and Enscore, David J., 4,573,995, Cl. 604-896.000.

Amada Company, Limited: *See—*
Yoneda, Akiyoshi, 4,573,360, Cl. 73-850.000.

Amano, Itaru; Maikuma, Yoshimata; Ozaki, Keiji; and Ohnishi, Hisaaki, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for unloading cured tires from a tire vulcanizing press. 4,573,859, Cl. 414-628.000.

Ambrose, John W.: *See—*
Lee, Graham L.; Shuttlewood, Jeffrey R.; and Ambrose, John W., 4,573,505, Cl. 141-92.000.

Ameda AG: *See—*
Schlensog, Klaus; Beer, Christian; and Riedweg, Robert, 4,573,969, Cl. 604-74.000.

American Cyanamid Company: *See—*
Padmanathan, Thurairajah, 4,574,155, Cl. 544-330.000.
Ryles, Roderick G.; and Robustelli, Albert G., 4,573,533, Cl. 166-275.000.

American Home Products Corporation: *See—*
Tuccillo, Mark J., 4,573,479, Cl. 128-698.000.

American Plasticraft Co.: *See—*
Simovits, Stephen S., Jr., 4,573,755, Cl. 339-111.000.

American Standard Inc.: *See—*
Sulfstede, Louis E.; Bergt, Carl; and Helt, Robert W., 4,573,326, Cl. 62-156.000.
Tischer, James C.; and Larson, James W., 4,573,324, Cl. 62-115.000.

Amlani, Kishan D., to Eaton Corporation. Multi-axis load transducer. 4,573,362, Cl. 73-862.040.

Amoco Corporation: *See—*
Blake, William R., 4,573,532, Cl. 166-264.000.

AMP Incorporated: *See—*
Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,573,262, Cl. 29-739.000.

Amtel, Inc.: *See—*
Pomonik, George M.; and Jansen, Martin B., 4,573,425, Cl. 114-230.000.

Amtrol Inc.: *See—*
O'Connor, Robert F., 4,573,611, Cl. 222-147.000.

Anchor/Darling Valve Company: *See—*
Husted, Rodney O., 4,573,660, Cl. 251-195.000.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Degassing extrusion device. 4,573,799, Cl. 366-89.000.

Andersen, Steen H.; and Pedersen, Bendt O., to Nordisk Ventilator Co. A/S. Spring biased bayonet coupling for fan blades. 4,573,874, Cl. 416-157.00R.

Anderson, Paul L., to Lamb Technicon Corp. Workpiece transfer device. 4,573,862, Cl. 414-753.000.

Anderson, Robert H., to Litton Systems, Inc. Magneto-optic image scanning detector. 4,574,312, Cl. 358-213.000.

Anderson, Thomas E., to General Electric Company. Ballast circuit for multiple parallel negative impedance loads. 4,574,222, Cl. 315-254.000.

Anderson, Warren, to Grumman Aerospace Corporation. Test system for electromagnetic trailer brake system. 4,573,350, Cl. 73-129.000.

Andersson, Kaj: *See—*
Andersson, Verner; and Andersson, Kaj, 4,573,931, Cl. 440-61.000.

Andersson, Kjell, to Seco Tools AB. Device for transferring fluid to a rotating tool holder. 4,573,836, Cl. 408-59.000.

Andersson, Verner; and Andersson, Kaj. Attachment means for outboard motors. 4,573,931, Cl. 440-61.000.
Andre, Wolfram K.: *See*—
Wolf, Kurt; and Andre, Wolfram K., 4,574,184, Cl. 219-440.000.
Andreas Stihl: *See*—
Lindemann, Bernd; Landwehr, Gotz; and Kaiser, Hans-Georg, 4,573,386, Cl. 83-833.000.
Andreasson, Bo C., to Aktiebolaget Electrolux. Actuator for the release of an automatic emergency brake of a hand-operated powered tool. 4,573,556, Cl. 188-137.000.
Andree, Dietrich; and Creutz, Walter, to Hoesch Aktiengesellschaft. Center-free large rolling bearing. 4,573,811, Cl. 384-622.000.
Andresen, Herman J. Controller of magnetically saturated type having programmed output characteristic. 4,574,286, Cl. 340-870.310.
Annis, Larry D., to Kendall Company, The. Liquid collection system having an anti-septic member on the discharge section. 4,573,983, Cl. 604-322.000.
Anstaett, Ralph E., Jr.: *See*—
Gibson, Galen R.; and Anstaett, Ralph E., Jr., 4,574,308, Cl. 358-188.000.
Aoki, Hideo; and Takahashi, Kazuaki, to Silver Seiko, Ltd. Ribbon lift device for a printer. 4,573,813, Cl. 400-214.000.
Aoki, Hiroyasu, to Yasui Sangyo Co., Ltd. Safety device for protecting fall of a lift. 4,573,552, Cl. 187-8.500.
Aoki, Shinichiro: *See*—
Miyazaki, Sachio; and Aoki, Shinichiro, 4,574,377, Cl. 370-104.000.
Aoyama, Masutoshi: *See*—
Takasaki, Masaru; and Aoyama, Masutoshi, 4,574,338, Cl. 362-278.000.
Apelman, Steven P., to Ragen Data Systems, Inc. Video synthesizer. 4,574,278, Cl. 340-722.000.
Apple, Christian K.: *See*—
Hill, William D.; Mercanti, William A., Jr.; Apple, Christian K.; and Loomis, Gary S., 4,574,068, Cl. 376-259.000.
Appleyard, Francis J.; and Young, John H., to Armstrong World Industries, Inc. Non-directional floor tile. 4,574,065, Cl. 264-76.000.
Application Engineering Corporation: *See*—
Waters, Michael A.; and Boll, Daniel P., 4,573,893, Cl. 425-71.000.
Applied Magnetics Corporation: *See*—
Inbar, Michael, 4,574,234, Cl. 324-73.00R.
Apsell, Sheldon P.: *See*—
Berger, Martin J.; and Apsell, Sheldon P., 4,573,954, Cl. 493-55.000.
APV Burnett & Rolfe Ltd.: *See*—
Lee, Graham L.; Shuttlewood, Jeffrey R.; and Ambrose, John W., 4,573,505, Cl. 141-92.000.
Arad, Abraham A.: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,573,943, Cl. 446-463.000.
Arakawa, Kazuhiko, to Canon Kabushiki Kaisha. Display device for focus detecting camera. 4,573,785, Cl. 354-409.000.
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, to Yamatake Honeywell. Data transmission system for use in an air conditioning control apparatus. 4,574,283, Cl. 340-825.080.
Arakawa, Satoshi, to Fuji Photo Optical Co., Ltd. Endoscope. 4,573,450, Cl. 128-6.000.
Arakawa, Satoshi; Matsuda, Terumi; Ishizuka, Akio; and Shibahara, Yoshihiko, to Fuji Photo Film Company, Ltd. Radiation image storage panel. 4,574,102, Cl. 428-212.000.
Arcair Company: *See*—
Strohl, Robert L.; Moore, Paul E.; and Toth, Alexander, 4,573,665, Cl. 266-48.000.
Arcu Armaturindustri AB: *See*—
Hammarstedt, Gosta, 4,573,493, Cl. 137-315.000.
Arens, Hans; Kern, Hans; and Haslberger, Richard, to Grunbeck Wasseraufbereitung GmbH. Tube separator. 4,573,491, Cl. 137-218.000.
Ares, Inc.: *See*—
Stoner, Eugene M., 4,573,395, Cl. 89-33.160.
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, to Olympus Optical Co., Ltd. Solid state image pick-up device. 4,574,309, Cl. 358-212.000.
Ariyama, Noriyuki: *See*—
Oguri, Yasuo; Awata, Mitsuru; and Ariyama, Noriyuki, 4,574,012, Cl. 106-120.000.
Armbruster, George E., to Illinois Bell Telephone Company. Temporary duct liner interconnect device. 4,573,715, Cl. 285-94.000.
Armstrong World Industries, Inc.: *See*—
Appleyard, Francis J.; and Young, John H., 4,574,065, Cl. 264-76.000.
Arndt, Klaus; and Sanvido, Saverio, to Contraves AG. Periscope-like sighting device. 4,573,773, Cl. 350-541.000.
Arnold, Dan M.; and Smith, Harry D., Jr., to Halliburton Company. Method for logging fluid flow rate, water fraction, and/or salinity of water flowing into a well. 4,574,193, Cl. 250-270.000.
Arnold, Jeffrey M.; Brosnahan, James R.; Koong, Terrence H.; Mans, Thomas A.; and Milo, Theodore A., to Datascope Corporation. Automatic pulse rate trigger-source select circuit. 4,573,478, Cl. 128-670.000.
Arrington, John P.; Jaraczewski, Kathleen A.; Moisson, Marc F.; and Wisecarver, Martin L., to Raychem Corp. Tube storage and delivery device. 4,573,607, Cl. 221-25.000.
Arrowhead Industrial Water, Inc.: *See*—
Pittner, Gregory A., 4,574,049, Cl. 210-639.000.
Arthro-Medic, Inc.: *See*—
Williams, J. Webster, Jr., 4,573,482, Cl. 128-804.000.
Artz, Gerd; and Figge, Dieter, to Haftung Fried. Krupp Gesellschaft mit beschrankter. Testing apparatus for detecting damage of the casting belts of a continuous casting mold. 4,573,521, Cl. 164-451.000.
Asada, Eiichi; Inokuma, Toshio; and Yamazoe, Mikio, to Shoei Chemical Inc. Resistor compositions. 4,574,055, Cl. 252-514.000.
Asada, Takafumi; Yoshida, Churyo; Koda, Minoru; and Ohno, Hideaki, to Matsushita Electric Industrial Co., Ltd. Fluid bearing device. 4,573,807, Cl. 384-100.000.
Asano, Makoto; Hasegawa, Kiyoharu; Tamura, Yukio; and Oono, Yoshihiro, to Mitsui Toatsu Chemicals, Incorporated. Process for producing microcapsules and microcapsule slurry. 4,574,110, Cl. 428-402.210.
Aschauer, Johann, to Voest-Alpine Aktiengesellschaft. Apparatus for feeding sheet metal elements to a bending. 4,573,861, Cl. 414-751.000.
ASEA Aktiebolag: *See*—
Persson, Hans, 4,573,335, Cl. 72-63.000.
Ashline, William J.: *See*—
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,573,259, Cl. 29-602.00R.
Aspen Laboratories, Inc.: *See*—
Kitchin, Dwight W., 4,573,888, Cl. 417-560.000.
Ast, Vincent N., Jr.: *See*—
Spindel, Howard R.; Ast, Vincent N., Jr.; and Brown, Gary L., 4,574,362, Cl. 364-900.000.
AT&T Bell Laboratories: *See*—
Cox, Herbert M., 4,574,093, Cl. 427-86.000.
Eng, Kai Y.; and Haskell, Barin G., 4,574,379, Cl. 370-104.000.
Glance, Bernard, 4,574,254, Cl. 331-17.000.
Gordon, Eugene I.; Hartman, Robert L.; and Nash, Franklin R., 4,573,255, Cl. 29-574.000.
Gritton, Charles W. K., 4,574,166, Cl. 179-170.200.
Scordo, Dominick, 4,574,374, Cl. 370-62.000.
Starr, Daniel C., 4,574,350, Cl. 364-200.000.
Williams, Gareth F., 4,574,249, Cl. 330-59.000.
AT&T Technologies, Inc.: *See*—
Dorey, John K., II; Huneke, James T.; Madsen, Bruce S.; and Schaaf, Theodore F., 4,574,031, Cl. 156-655.000.
Hechtman, Charles D., 4,574,236, Cl. 324-158.00F.
ATIC S.r.l.: *See*—
Piovesan, Alessandro, 4,573,826, Cl. 404-90.000.
Atkinson, Brian: *See*—
Rosiek, Jozef; Spruce, Frank; and Atkinson, Brian, 4,573,446, Cl. 126-92.00R.
Atkinson, Walter E., to Engineered Data Products, Inc. Reel stabilizer and ejection device. 4,573,589, Cl. 211-41.000.
Atlas Metal Industries, Inc.: *See*—
Ramey, Edwin O., 4,573,415, Cl. 108-129.000.
ATOCHEM: *See*—
Kervennal, Jacques; and Durual, Pierre, 4,574,059, Cl. 560-347.000.
Atsugi Motor Parts Co., Ltd.: *See*—
Hadama, Shigeyuki; and Sugizaki, Kyoichi, 4,573,890, Cl. 418-108.000.
Io, Shinichi; and Saeki, Funio, 4,573,258, Cl. 29-596.000.
Atsumi, Shigeru; and Tanaka, Sumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit for changing the voltage level of binary signals. 4,574,273, Cl. 307-475.000.
Auch, Wilfried; Mohr, Friedemann; Schlemper, Eberhard; and Steudle, Walter, to International Standard Electric Corporation. Rotation rate measuring instrument. 4,573,795, Cl. 356-350.000.
Audeh, Costandi A.; and Offenhauer, Robert D., to Mobil Oil Corporation. In-situ gasification of tar sands utilizing a combustible gas. 4,573,530, Cl. 166-260.000.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Pischke, Reiner; and Kohler, Karl-Heinz, 4,573,440, Cl. 123-333.000.
Aumann, James T.: *See*—
Carroll, Jimmy L.; and Aumann, James T., 4,573,539, Cl. 175-58.000.
Austin, Paul R., to University of Delaware. Dry free-flowing water-soluble complexes of chitosan. 4,574,150, Cl. 536-20.000.
Automa s.r.l. Costruzione Macchine Automatiche: *See*—
Baccianti, Renato, 4,573,959, Cl. 493-458.000.
Automated Portion Control Technology, Inc.: *See*—
Sullivan, Norman D.; and Baker, Forrest E., 4,573,388, Cl. 83-867.000.
Awaga, Makoto: *See*—
Mori, Shosuke; Awaga, Makoto; Fujisaku, Kiminori; Yamauchi, Mitsuru; and Ono, Hitoshi, 4,574,347, Cl. 364-200.000.
Awata, Mitsuru: *See*—
Oguri, Yasuo; Awata, Mitsuru; and Ariyama, Noriyuki, 4,574,012, Cl. 106-120.000.
Ayers, Ray R.: *See*—
Kipp, Robert M.; and Ayers, Ray R., 4,573,713, Cl. 285-319.000.
Ayliffe, Peter J.: *See*—
Crossland, William A.; Peters, Jack R.; Ross, Peter W.; and Ayliffe, Peter J., 4,574,282, Cl. 340-784.000.
B. F. Goodrich Company, The: *See*—
Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., 4,573,894, Cl. 425-36.000.
Baba, Fumio, to Fujitsu Limited. Clock generating circuit providing a boosted clock signal. 4,574,203, Cl. 307-269.000.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Kotaka, Ikuo, 4,573,524, Cl. 165-96.000.
Babington, Robert S., to Babington, Robert S. Liquid delivery apparatus and method for liquid fuel burners and liquid atomizers. 4,573,904, Cl. 431-117.000.

Baccianti, Renato, to Automa s.r.l. Costruzione Macchine Automatiche. Fabric folding machine. 4,573,959, Cl. 493-458.000.

Bachalo, Larry E. Lifting device for removing honey comb assemblies from supers. 4,573,228, Cl. 6-12.00R.

Baggs, Burton D.: *See*—
Smith, Alexander; and Baggs, Burton D., 4,573,306, Cl. 56-10.400.

Baird, Thomas E., Sr.; and Jailor, John J., to Scott & Fetzer Company, The. Rug cleaning attachment. 4,573,235, Cl. 15-328.000.

Baker, Donal E., to Westinghouse Electric Corp. Inverter with constant voltage to frequency ratio output capability. 4,574,340, Cl. 363-41.000.

Baker, Forrest E.: *See*—
Sullivan, Norman D.; and Baker, Forrest E., 4,573,388, Cl. 83-867.000.

Baker Perkins, Pty., Ltd.: *See*—
Jones, Donald A.; Wawra, Gerhard F.; and Moss, William R., 4,573,898, Cl. 425-145.000.

Baker, Ralph; and Lifshitz, Ran, to Colorado State University Research Foundation. Isolates of pythium species which are antagonistic to *Pythium ultimum*. 4,574,083, Cl. 424-93.000.

Baker, Terry L. Billiard glove. 4,573,220, Cl. 2-161.00A.

Baker, Wilford S.; and Harrison, James J., to Gulf Oil Corporation. Cement compositions and method of cementing casing in a well. 4,573,534, Cl. 166-293.000.

Bald, Hubert. Apparatus for producing an adjusting torque. 4,573,379, Cl. 82-28.00R.

Bald, Hubert. Apparatus for producing an adjusting rotary movement. 4,573,380, Cl. 82-28.00R.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Oxazoles and thiazoles containing an aminohydroxypropoxyphenyl moiety. 4,574,127, Cl. 514-365.000.

Ball Corporation: *See*—
Cerny, Daryl D.; and Diebolt, Edwin J., 4,574,067, Cl. 264-209.800.

Banff Golf Company, Inc.: *See*—
Young, Henry N., IV; and Smith, Richard C., 4,573,685, Cl. 273-173.000.

Bankovski, Dimiter N.: *See*—
Petkov, Georgi K.; Netzov, Nikola M.; Botev, Botyo P.; and Bankovski, Dimiter N., 4,573,841, Cl. 409-244.000.

Barbee, Robert B.: *See*—
Wicker, Thomas H., Jr.; and Barbee, Robert B., 4,574,148, Cl. 528-173.000.

Bareth, Erich, to Kaltenbach & Voight GmbH & Co. Clamping arrangement for the clamping engagement of instruments. 4,573,918, Cl. 433-127.000.

Baril, Michel: *See*—
Sillard, Gilles; and Baril, Michel, 4,574,288, Cl. 343-781.00P.

Barmatz, Martin B.; Allen, James L.; and Gaspar, Mark S., to California Institute of Technology. Single transducer levitator. 4,573,356, Cl. 73-505.000.

Barot, Devendra T., to Texaco Inc. Coal gasification combustion chamber structure. 4,574,002, Cl. 48-77.000.

Bartley, Donald R.: *See*—
Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., 4,573,894, Cl. 425-36.000.

Bartman, Nicholas: *See*—
Frampton, Jeffery A.; and Bartman, Nicholas, 4,573,735, Cl. 296-218.000.

Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, to Ciba-Geigy Corporation. Antigen derivatives and processes for their preparation. 4,574,058, Cl. 260-112.50R.

Bascou, Jacques, to Regie Nationale des Usines Renault. Remote control device having a pivoting case cover. 4,574,285, Cl. 340-825.690.

BASF Aktiengesellschaft: *See*—
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, 4,574,131, Cl. 523-209.000.

Bassett, James H.: *See*—
Ehrecke, Kevin L.; Braet, Jerome A.; and Bassett, James H., 4,573,308, Cl. 56-14.400.

Bataille, Jean M., to Dynapac AB. Double-safety arrangement for a self-propelled hand-guided machine. 4,573,543, Cl. 180-19.100.

Bateman, Charles D., to Sundstrand Data Control, Inc. Helicopter weight measuring system. 4,574,360, Cl. 364-567.000.

Bateman, Robert L., Jr.; and Soules, Thomas F., to General Electric Company. Metal vapor lamp having internal means promoting condensate film formation. 4,574,218, Cl. 313-635.000.

Battson, Donald F., to RCA Corporation. Cascaded CCD shift registers having different numbers of clocking phases. 4,574,313, Cl. 358-213.000.

Baum, Marcel, to Dragerwerk Aktiengesellschaft. Respiratory system. 4,573,462, Cl. 128-204.250.

Baum, Thomas H.; Houle, Frances A.; Jones, Carol R.; and Kovac, Caroline A., to International Business Machines Corporation. Selective deposition of copper. 4,574,095, Cl. 427-53.100.

Bauman, Jack. Laryngoscope blade with a bendable tip. 4,573,451, Cl. 128-11.000.

Baumberg, Iosif. Apparatus for elevating liquids including a pair of Venturi pipes having wind as motive fluid. 4,573,877, Cl. 417-76.000.

Baxter Travenol Laboratories, Inc.: *See*—
Dolkart, Ralph E.; and Kartinos, Nicholas J., 4,574,085, Cl. 424-148.000.
Karrasch, Frank; and Love, John F., 4,573,980, Cl. 604-256.000.
Ruschke, Rick, 4,573,974, Cl. 604-81.000.

Bayer Aktiengesellschaft: *See*—
Hassdenteufel, Jurgen-Rolf, 4,574,159, Cl. 560-157.000.
Ippen, Jakob; and Stuttgen, Friedel, 4,573,510, Cl. 152-159.000.
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,574,124, Cl. 514-228.000.
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.
Meckel, Walter, 4,574,147, Cl. 528-64.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Jovanovic, Milenko, 4,574,175, Cl. 219-86.100.
Schier, Gunther, 4,573,697, Cl. 280-276.000.

Baylor College of Medicine: *See*—
Noon, George P.; Feldman, Louis W.; and Peterson, Julia A., 4,573,883, Cl. 417-394.000.

Bayshore, Charles A., to Vistakon, Inc. Bifocal contact lens. 4,573,775, Cl. 351-161.000.

BBC Brown, Boveri & Co., Ltd.: *See*—
Fust, Armin; and Starcevic, Mihailo, 4,573,810, Cl. 384-322.000.

Beatty, Robert M.; Miller, Edward B.; and Huber, Paul G., to General Electric Company. Arrangement for sensing remote binary inputs. 4,574,355, Cl. 364-492.000.

Beckman Instruments, Inc.: *See*—
Kampf, Richard S., 4,574,196, Cl. 250-328.000.

Becton, Dickinson and Company: *See*—
Wilner, Leslie B., 4,574,327, Cl. 361-283.000.

Beer, Christian: *See*—
Schlensog, Klaus; Beer, Christian; and Riedweg, Robert, 4,573,969, Cl. 604-74.000.

Bell & Howell Company: *See*—
Svyatsky, Eduard; Rabindran, K. George; and Faber, Thomas J., 4,573,675, Cl. 271-122.000.

Bello, Lino L. Artificial endo-osseous pillar for supporting fixed prosthetic members. 4,573,922, Cl. 433-176.000.

Bemis Company, Inc.: *See*—
Wildmoser, Martin M., 4,573,305, Cl. 53-466.000.

Benjamin, James A.; Schutten, Herman P.; and Lade, Robert W., to Eaton Corporation. Lateral bidirectional dual notch FET with nonplanar main electrodes. 4,574,207, Cl. 307-577.000.

Benjamin, James A.: *See*—
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., 4,574,208, Cl. 307-577.000.
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., 4,574,209, Cl. 307-577.000.

Bennett, Laurence M., to Warner-Lambert Company. Device for RF welding an IV tube to a catheter lumen. 4,574,173, Cl. 219-10.530.

Benscoter, Richard D.; Hadfield, Robert W.; and Bowman, Timothy S., to Butler Manufacturing Company. Economy poke-thru. 4,573,297, Cl. 52-221.000.

Benson, Florence; and Shireman, Mark J., to Honeywell Inc. Automatic lead wire tinning of tape-packaged components. 4,573,430, Cl. 118-411.000.

Benson, Richard C.: *See*—
Potember, Richard S.; Poehler, Theodore O.; and Benson, Richard C., 4,574,366, Cl. 365-153.000.

Benzies, George Y. Waste retaining receptacles for patients with colostomies and ileostomies. 4,573,984, Cl. 604-339.000.

Berger, Martin J.; and Apsell, Sheldon P., to PepsiCo Inc. Digital encoding and electronic scanning of drink cups. 4,573,954, Cl. 493-55.000.

Berger, Peter. Process for the preparation of a modified aqueous chlorite solution, the solution prepared by this process and the use thereof. 4,574,084, Cl. 424-128.000.

Berger, Robert P. Prosthesis and apparatus for molding the prosthesis. 4,573,921, Cl. 433-167.000.

Berglund, Jan, to Wicanders AB. Screw cap with security ring. 4,573,601, Cl. 215-252.000.

Bergrath, Siegmar; and Kappertz, Fritz, to Singer Spezialnadelfabrik GmbH. Needle packaging. 4,573,575, Cl. 206-380.000.

Bergt, Carl: *See*—
Sulfstede, Louis E.; Bergt, Carl; and Helt, Robert W., 4,573,326, Cl. 62-156.000.

Bernard, Jean: *See*—
Beyl, Jean; Bernard, Jean; le Faou, Daniel; and Peyre, Henri, 4,573,700, Cl. 280-605.000.

Berruti, Pierangelo; and Cella, Giancarlo, to Ing. C. Olivetti & C. S.p.A. Dot matrix printer. 4,573,814, Cl. 400-568.000.

Bertrams, Josef, to W. Schlafhorst & Co. Method and apparatus for feeding a dosed mixture of splicing air and liquid into the splicing chamber of a compressed-air yarn splicing device. 4,573,313, Cl. 57-22.000.

Besemer, James J.: *See*—
Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., 4,574,354, Cl. 364-481.000.

Beuhler, Allyson J.: *See*—
Polak, Anthony J.; Wrezel, James A.; and Beuhler, Allyson J., 4,573,768, Cl. 350-357.000.

Beyl, Jean; Bernard, Jean; le Faou, Daniel; and Peyre, Henri, to STE Look. Ski brake. 4,573,700, Cl. 280-605.000.

Bezler, Wilhelm; and Stark, Ewald, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Adjustment arrangement for circumferential register in rotary printing machines. 4,573,408, Cl. 101-248.000.

Bezner, Baruch J., to Dan-Pal. Light transmitting wall panels. 4,573,300, Cl. 52-563.000.

Bielfeldt, Klaus; and Braun, Dieter J., to Vereinigte Aluminiumwerke Aktiengesellschaft. Process for producing finely divided dispersions of metal oxides in aluminum hydroxide. 4,574,001, Cl. 23-301.000.

Biesinger, Peter J. Cuttling machine for continuous input of web. 4,573,958, Cl. 493-415.000.

Bilezerian, Mel E.: *See—*
Racca, William H.; Bolvin, Michael A.; and Bilezerian, Mel E., 4,574,200, Cl. 307-117.000.

Billberg, Alf, to Tetra Pak International AB. System for the transport and raising of packing container blanks. 4,573,957, Cl. 493-309.000.

Binder, Alfred, to Kress-Electrik GmbH & Co. Method and apparatus for controlling an electric motor the rotational speed of which is automatically reduced in no-load idling operation. 4,574,226, Cl. 318-317.000.

Bio-Rad Laboratories, Inc.: *See—*
Delony, Timothy E.; and Chu, Daniel Y. M., 4,574,040, Cl. 204-299.00R.

Biraghi, Giuseppe; Clavarino, Amedeo; Roth, Ferdinando; and Tarquini, Michele. Container for a rotating transparency projector fixable at a selected height on a vertical guide. 4,573,748, Cl. 312-7.200.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
Wiemann, Dieter; and Bodusch, Gunther, 4,573,899, Cl. 425-145.000.

Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See—*
Weinundbrot, Hubert, 4,574,027, Cl. 156-352.000.

Black & Decker Inc.: *See—*
Merkator, Manfred; and Schmid, Karl, 4,573,621, Cl. 227-8.000.

Blackwell, George F.; and Tomlinson, Harold W., Jr. Gray scale image processor. 4,574,393, Cl. 382-17.000.

Blake, Larry W., to Innovative Surgical Products, Inc. Irrigation/aspiration tip. 4,573,979, Cl. 604-240.000.

Blake, William R., to Amoco Corporation. Jacquard fluid controller for a fluid sampler and tester. 4,573,532, Cl. 166-264.000.

Blank, John M.: *See—*
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.

Blasius, Udo; May, Karl-Heinz; and Rodi, Anton, to Heidelberger Druckmaschinen AG. Printing press with register motors. 4,573,410, Cl. 101-365.000.

Blaushild, Ronald M.; and Tome, Richard E., to Westinghouse Electric Corp. Thermal insulation of nuclear reactor. 4,574,070, Cl. 376-289.000.

Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., to B. F. Goodrich Company, The. Apparatus for ventless tire molding. 4,573,894, Cl. 425-36.000.

Blue, Larry A.; and Conner, David E., to International Business Machines Corp. Current controlled motor drive circuit. 4,574,228, Cl. 318-696.000.

Blum, Albert. Hoisting apparatus for electric submersible pump units. 4,573,726, Cl. 294-86.330.

Bodusch, Gunther: *See—*
Wiemann, Dieter; and Bodusch, Gunther, 4,573,899, Cl. 425-145.000.

Boeing Company, The: *See—*
Clayton, James L., 4,573,650, Cl. 244-118.500.
Holton, Raymond G. C., 4,574,325, Cl. 361-218.000.
Scallon, Gregory M., 4,574,348, Cl. 364-200.000.
Yourkowski, Frank M.; and Zoerb, Melvin C., 4,573,649, Cl. 244-102.00R.

Boettger, Conrad H. Urinal holder for hospital overbed stand and the like. 4,573,653, Cl. 248-153.000.

Boll, Daniel P.: *See—*
Waters, Michael A.; and Boll, Daniel P., 4,573,893, Cl. 425-71.000.

Bolton, Theodore S.; and Michaels, John H., to Carrier Corporation. Apparatus for mounting a packaged terminal air controller to a plastic well sleeve. 4,573,328, Cl. 62-263.000.

Bolvin, Michael A.: *See—*
Racca, William H.; Bolvin, Michael A.; and Bilezerian, Mel E., 4,574,200, Cl. 307-117.000.

Bonjour, Christian; and Duvanel, Francois, to Stellram S.A. Sintered alloy based on carbides. 4,574,011, Cl. 75-241.000.

Bonnet, Yves A., to International Business Machines Corporation. Circuit for holding a pulse during a predetermined time interval and an improved monostable multivibrator. 4,574,204, Cl. 307-273.000.

Bonzo, Roy T., to Corning Glass Works. Apparatus for selectively manifolding honeycomb structures. 4,573,896, Cl. 425-125.000.

Booth, Barclay: *See—*
Clar, Milton; and Booth, Barclay, 4,573,409, Cl. 101-426.000.

Booth, Stuart E.; Clifford, Andrew W.; and Parratt, Noel J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Fiber-reinforced metals. 4,573,517, Cl. 164-61.000.

Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., to Allied Corporation. Homogeneous low melting point copper based alloys. 4,573,630, Cl. 228-263.180.

Boston University: *See—*
Shapiro, Jerrold M., 4,573,778, Cl. 351-219.000.

Botev, Botyo P.: *See—*
Petkov, Georgi K.; Netzov, Nikola M.; Botev, Botyo P.; and Bankovski, Dimiter N., 4,573,841, Cl. 409-244.000.

Boudet, Jean; and Rolland, Guy, to Essilor International Cie Generale d'Optique. Optical component molding apparatus for following the differential shrinkage of molded synthetic material. 4,573,903, Cl. 425-555.000.

Bouglas, Allan B., to British Replin Limited. Flame-resistant fabrics. 4,573,500, Cl. 139-426.00R.

Boumendil, Jean-Jack: *See—*
Pescatore, Richard; and Boumendil, Jean-Jack, 4,574,182, Cl. 219-388.000.

Bournay, Frederick M., Jr.; and Giurtino, Joel F., to Cordis Corporation. LED Staggered back lighting panel for LCD module. 4,573,766, Cl. 350-345.000.

Bowden, Arthur H. Method for producing multiple food turnovers. 4,574,088, Cl. 426-275.000.

Bowman, Timothy S.: *See—*
Benscoter, Richard D.; Hadfield, Robert W.; and Bowman, Timothy S., 4,573,297, Cl. 52-221.000.

Boxhorn, George R.: *See—*
Boxhorn, John F.; and Boxhorn, George R., 4,573,432, Cl. 119-28.000.

Boxhorn, John F.; and Boxhorn, George R., to C. I. Banker Wire & Iron Works, Inc. Wire mesh flooring. 4,573,432, Cl. 119-28.000.

Boyd, Hermon; A. Thermally actuated heat exchange method and system. 4,573,525, Cl. 165-104.220.

Boyle, William J., Jr.; Mares, Frank; and Wallo, Andrea M., to Allied Corporation. Selective conversion of acrylonitrile into 1,4-dicyano-1-butene catalyzed by polymer-bound alkyl diarylphosphinites. 4,574,060, Cl. 558-457.000.

BP Chemicals Limited: *See—*
Umpleby, Jeffrey D., 4,574,133, Cl. 524-147.000.

Braas & Co. GmbH: *See—*
Hofmann, Karl-Heinz, 4,573,291, Cl. 52-43.000.

Brachold, Rudolph W.: *See—*
Burack, Robert D.; and Brachold, Rudolph W., 4,574,172, Cl. 219-10.49R.

Bradley, Ralph H., to North American Philips Consumer Electronics Corp. Rear projection screen. 4,573,764, Cl. 350-128.000.

Brady, Charles J.: *See—*
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., 4,573,842, Cl. 410-23.000.

Braet, Jerome A.: *See—*
Ehrecke, Kevin L.; Braet, Jerome A.; and Bassett, James H., 4,573,308, Cl. 56-14.400.

Bran & Lubbe GmbH: *See—*
Petersen, Dirk, 4,573,885, Cl. 417-383.000.

Braswell, Charles, to Tejas Designs, Inc. Swingable tire carrier. 4,573,855, Cl. 414-463.000.

Braun, Dieter J.: *See—*
Bielfeldt, Klaus; and Braun, Dieter J., 4,574,001, Cl. 23-301.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Chain conveyor driver construction. 4,573,565, Cl. 198-719.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,573,565, Cl. 198-719.000.

Breault, Richard D.; Sawyer, Richard D.; and DeMarche, Thomas E., to United Technologies Corporation. Cooling system for electrochemical fuel cell. 4,574,112, Cl. 429-26.000.

Bredeweg, Roger L., to Leco Corporation. Carbon, hydrogen, and nitrogen analyzer. 4,573,910, Cl. 432-156.000.

Breed Corporation: *See—*
Breed, David S., 4,573,706, Cl. 280-734.000.

Breed, David S., to Breed Corporation. Passenger compartment sensor requiring substantial velocity change. 4,573,706, Cl. 280-734.000.

Bremer, Guenter, to Daimler-Benz Aktiengesellschaft. Arrangement for the mounting of measuring devices of axle measurement equipments. 4,573,275, Cl. 33-288.000.

Bresser, Robert E.; and Wursthorn, Karl R., to Morton Thiokol, Inc. Stabilizer compositions for PVC resins. 4,574,135, Cl. 524-182.000.

Breyer, Fritz-Werner: *See—*
Meyer, Wolfgang K.; and Breyer, Fritz-Werner, 4,573,856, Cl. 414-561.000.

Brian, James A., to Crown Zellerbach Corporation. Corner lock on paperboard baking and shipping tray. 4,573,633, Cl. 229-32.000.

Briggs, Aubrey C.: *See—*
Pater, Larry L.; and Briggs, Aubrey C., 4,573,637, Cl. 239-11.000.

Brinks, Robert J.: *See—*
Dilworth, James L.; and Brinks, Robert J., 4,573,636, Cl. 239-2.00S.

Brissette, Ronald N., to Rockwell International Corporation. Driveline. 4,573,946, Cl. 464-133.000.

Bristol, Alexander C. Aspheric spectacle lens blank. 4,573,777, Cl. 351-167.000.

Bristol-Myers Company: *See—*
Ellis, Jeffrey, 4,573,590, Cl. 211-86.000.
Nair, Xina; and Temple, Davis L., Jr., 4,574,129, Cl. 514-540.000.

British Replin Limited: *See—*
Bouglas, Allan B., 4,573,500, Cl. 139-426.00R.

Brockmanns, Karl-Josef; and Lunenschloss, Joachim, to W. Schlafhorst & Co. Friction spinning apparatus. 4,573,312, Cl. 57-5.000.

Brorsson, Tommy K. L., to Safety Transport Inter Development AB. Arrangement in vehicle safety belts of the three-point type. 4,573,708, Cl. 280-808.000.

Brosnahan, James R.: *See—*
Arnold, Jeffrey M.; Brosnahan, James R.; Koong, Terrence H.; Mans, Thomas A.; and Milo, Theodore A., 4,573,478, Cl. 128-670.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Watanabe, Yasunori, 4,573,815, Cl. 400-642.000.

Brotton, James: *See—*
Wilman, Hugh; and Brotton, James, 4,574,316, Cl. 358-285.000.

Brown, Gary L.: *See—*
Spindel, Howard R.; Ast, Vincent N., Jr.; and Brown, Gary L., 4,574,362, Cl. 364-900.000.

Brown, Michael, to Northern Telecom Limited. Tone ringer for telephone sets and other telecommunications apparatus. 4,574,272, Cl. 340-384.00R.

Brown, Robert W., to Production Design Products, Inc. Carpet rolling machine. 4,573,644, Cl. 242-67.10R.

Browne, John S.: *See—*
Yearout, James D.; Provin, Robert R.; and Browne, John S., 4,574,007, Cl. 62-42.000.

Bruce, Mark R.: *See—*
Pyke, Stephen C.; and Bruce, Mark R., 4,574,039, Cl. 204-290.00R.

Bruhn, Bernhard, to Koh-I-Noor Rapidograph, Inc. Ink dropper closure. 4,573,503, Cl. 141-24.000.

Brunswick Corporation: *See—*
Entringer, David C.; Gruenwald, David J.; and Felix, Dale K., 4,573,318, Cl. 60-310.000.

BTU Engineering Corporation: *See—*
Sarkozy, Robert F., 4,573,431, Cl. 118-725.000.

Buckhorn Material Handling Group Inc.: *See—*
Miller, Daniel R., 4,573,577, Cl. 206-506.000.

Buddy L Corp.: *See—*
Holden, John; Colombrito, Sam; and Jeffreys, Arthur H., 4,573,941, Cl. 446-451.000.
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,573,943, Cl. 446-463.000.

Buffalo Brake Beam: *See—*
Malachowski, Jerome A.; and Horvatis, James F., 4,573,555, Cl. 188-52.000.

Bullara, Leo A., to Huntington Institute of Applied Research. Implantable electrode array. 4,573,481, Cl. 128-784.000.

Burack, Robert D.; and Brachold, Rudolph W., to Westinghouse Electric Corp. Brazing wand with fiber optic temperature sensor. 4,574,172, Cl. 219-10.49R.

Burlington Industries, Inc.: *See—*
Daniel, Vernon T.; Johnson, James R.; and Robbins, Edward J., 4,573,353, Cl. 73-198.000.

Burns, William K.; and Moeller, Robert P., to United States of America, Navy. Analog fiber gyro with extended linear range. 4,573,797, Cl. 356-350.000.

Buroff, Arthur N. Self-propelled recreational vehicle. 4,573,696, Cl. 280-247.000.

Burr-Brown Corporation: *See—*
Cohen, Marvin M.; and Payne, Francis L., 4,574,330, Cl. 361-388.000.

Butler Manufacturing Company: *See—*
Benscoter, Richard D.; Hadfield, Robert W.; and Bowman, Timothy S., 4,573,297, Cl. 52-221.000.

Butler, Robert M., to Microglass, Inc. Semiconductor wafer transfer apparatus and method. 4,573,851, Cl. 414-404.000.

C. I. Banker Wire & Iron Works, Inc.: *See—*
Boxhorn, John F.; and Boxhorn, George R., 4,573,432, Cl. 119-28.000.

C. I. Hayes Inc.: *See—*
Westeren, Herbert W.; Harrison, Ronald A.; and Tavitian, Vartan M., 4,573,667, Cl. 266-114.000.

Calabro, Anthony D. Cage apparatus for printed circuit boards and method for preventing sharp spikes in the signal applied to said printed circuit boards. 4,574,332, Cl. 361-413.000.

Calhoun, Wiley C.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.

California Institute of Technology: *See—*
Barmatz, Martin B.; Allen, James L.; and Gaspar, Mark S., 4,573,356, Cl. 73-505.000.

Call, Daniel D., to Oy Fiskars AB. Folding fillet knife with blade latching means. 4,573,268, Cl. 30-161.000.

Calvo-Riera, Francisco: *See—*
Kaplan, Henry S.; Teng, Nelson N. H.; Lam, Kit S.; and Calvo-Riera, Francisco, 4,574,116, Cl. 435-68.000.

Cam Gears Limited: *See—*
Wilson, Alan G., 4,573,399, Cl. 92-110.000.

Cameron, Donald C., to Dow Chemical Company, The. Reducer coupling and positioner tool for the coupling. 4,573,712, Cl. 285-12.000.

Cameron, Robert W. Floating search and rescue inflatable pyramid. 4,573,933, Cl. 441-16.000.

Campbell, John G.; and Schoeneberger, Carl F., to Tocum, Incorporated. Remote hub television and security systems. 4,574,305, Cl. 358-86.000.

Campen, Lawrence E., to General Motors Corporation. Hardbar energy absorbing and vibration damping bumper system damping feature. 4,573,724, Cl. 293-136.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
Carrier, Christian J. L.; and Shea, Charles J., 4,573,316, Cl. 60-39.823.

Canon Kabushiki Kaisha: *See—*
Arakawa, Kazuhiko, 4,573,785, Cl. 354-409.000.
Kato, Masatake, 4,573,781, Cl. 354-201.000.
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,573,788, Cl. 355-14.00R.
Suzuki, Kenji, 4,573,784, Cl. 354-406.000.

Cantin, Michel; Jaussaud, Pierre; and Olivella, Roger, to Institut National Polytechnique de Grenoble. Device for fixing a telpher chair to a cable provided with a travelling surface for rollers. 4,573,414, Cl. 104-202.000.

Cappelli, Alberto: *See—*
Ciaperoni, Aldemaro; and Cappelli, Alberto, 4,574,054, Cl. 252-188.310.

Caretto, Robert J. Method of constructing houses. 4,573,302, Cl. 52-742.000.

Carl Still GmbH & Co. KG, Firma: *See—*
Lemke, Otto; Stalherm, Dieter; and Haack, Reimer, 4,574,034, Cl. 201-1.000.

Carlgren, Richard G.; Reed, Martin A.; and Rosenbaum, Walter S., to International Business Machines Corporation. Mixed mode enhanced resolution hyphenation function for a text processing system. 4,574,363, Cl. 364-900.000.

Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., to Murphy Management, Inc. Dump valve. 4,573,489, Cl. 137-59.000.

Carpenter, Francis W., III: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,573,403, Cl. 100-43.000.

Carpenter, Marvin L. Self-loading trailer. 4,573,845, Cl. 414-24.500.

Carrier, Christian J. L.; and Shea, Charles J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Integrated weatherseal/igniter for solid rocket motor. 4,573,316, Cl. 60-39.823.

Carrier Corporation: *See—*
Bolton, Theodore S.; and Michaels, John H., 4,573,328, Cl. 62-263.000.

Carroll, Jimmy L.; and Aumann, James T., to Norton Christensen, Inc. Hydraulically pulsed indexing system for sleeve-type core barrels. 4,573,539, Cl. 175-58.000.

Carson, Charles F. Apparatus for producing simulated felled seam. 4,573,420, Cl. 112-142.000.

Carstensen, Kenneth J. System and method for assuring integrity of tubular sections. 4,573,359, Cl. 73-761.000.

Carville, Donna B.; Feig, Edwin R.; Rose, Gene D.; and Pulliam, Mary H., to Dow Chemical Company, The. Additives for nonaqueous liquids. 4,573,488, Cl. 137-13.000.

Castrantas, Harry M., to FMC Corporation. Removal of hydrogen sulfide from geothermal steam. 4,574,076, Cl. 423-224.000.

Cavalli, Alfredo. Machine for making ice-cream and similar cold products, with a removable freezing container. 4,573,329, Cl. 62-342.000.

Celanese Corporation: *See—*
Gibbon, John D.; Lawler, Terry E.; Yoon, Hyun-Nam; and Charbonneau, Larry F., 4,574,066, Cl. 264-85.000.

Cella, Giancarlo: *See—*
Berruti, Pierangelo; and Cella, Giancarlo, 4,573,814, Cl. 400-568.000.

Cerny, Daryl D.; and Diebolt, Edwin J., to Ball Corporation. Crosshead with static mixers. 4,574,067, Cl. 264-209.800.

Champagne, Claude J.: *See—*
Kemp, Michael F.; and Champagne, Claude J., 4,574,375, Cl. 370-67.000.

Chap, John P., to Selfix, Inc. Molded shower shelf. 4,573,591, Cl. 211-113.000.

Chapman, David N., to Sundstrand Corporation. Multiple schedule valve. 4,573,661, Cl. 251-234.000.

Charbonneau, Larry F.: *See—*
Gibbon, John D.; Lawler, Terry E.; Yoon, Hyun-Nam; and Charbonneau, Larry F., 4,574,066, Cl. 264-85.000.

Charnock, Ronald S., to Loctite (Ireland) Ltd. Curable adhesive composition toughened with styrene-butadiene block copolymer rubbers. 4,574,142, Cl. 525-305.000.

Checon Corporation: *See—*
Conaway, Donald E., Jr.; and Jost, Ernest M., 4,573,265, Cl. 29-879.000.

Chemcrete International: *See—*
Cummings, Lowell O., 4,574,145, Cl. 525-509.000.

Chemische Werke Huels, AG: *See—*
Homann, Walter K., 4,574,157, Cl. 548-239.000.

Chen, Kwang-Ming: *See—*
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Wo, Chee-Yuan, 4,574,141, Cl. 525-252.000.

Chen, Yu-Ling; Chun, Leslie L.; and Enscore, David J., to ALZA Corporation. Transdermal therapeutic systems for the administration of naloxone, naltrexone and nalbuphine. 4,573,995, Cl. 604-896.000.

Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Wo, Chee-Yuan, to Formosa Plastics Corporation. Method for producing graft-copolymers of vinyl chloride and polyfluorine resin by copolymerization. 4,574,141, Cl. 525-252.000.

Chester, Arthur W.; Garwood, William E.; and Vartuli, James C., to Mobil Oil Corporation. Catalytic process for manufacture of low pour lubricating oils. 4,574,043, Cl. 208-59.000.

Cheung, Harry, to Union Carbide Corporation. Process to produce a krypton-xenon concentrate from a liquid feed. 4,574,006, Cl. 62-22.000.

Chevron Research Company: *See—*
Demaison, Gerard J.; and Kaplan, Isaac R., 4,574,118, Cl. 436-29.000.
Krug, Russell R., 4,574,044, Cl. 208-120.000.

Chichester, Willard L., to Clark Equipment Company. Vehicle hydraulic system with single pump. 4,573,319, Cl. 60-422.000.

Chichibu Cement Kabushiki Kaisha: *See*—
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.
Chinon Kabushiki Kaisha: *See*—
Maruyama, Takashi, 4,573,783, Cl. 354-403.000.
Chiu, Norman H.; and Schneider, David A., to General Electric. Self-diagnostic system for an appliance incorporating an automatic ice-maker. 4,573,325, Cl. 62-129.000.
Choi, Yoon H. Electrical door lock. 4,573,333, Cl. 70-279.000.
Chu, Daniel Y. M.: *See*—
Delony, Timothy E.; and Chu, Daniel Y. M., 4,574,040, Cl. 204-299.00R.
Chu, Samuel K. F.: *See*—
Yao, Samuel S.; and Chu, Samuel K. F., 4,573,873, Cl. 416-114.000.
Chun, Leslie L.: *See*—
Chen, Yu-Ling; Chun, Leslie L.; and Enscore, David J., 4,573,995, Cl. 604-896.000.
Chung, Alfred: *See*—
Gavras, Haralambos P.; Ryan, James W.; and Chung, Alfred, 4,574,079, Cl. 424-1.100.
Chuo Hatsujo Kabushiki Kaisha: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,574,016, Cl. 148-144.000.
Ciaperoni, Aldemaro; and Cappelli, Alberto, to Snia Fibre S.p.A. Molecular weight controllers combination for caprolactam polymerization processes. 4,574,054, Cl. 252-188.310.
Ciba-Geigy Corporation: *See*—
Baschang, Gernard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,574,058, Cl. 260-112.50R.
Citizen Watch Company Limited: *See*—
Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, 4,573,261, Cl. 29-701.000.
Clar, Milton; and Booth, Barclay, to Paper, Inc. Method of treating printed computer paper. 4,573,409, Cl. 101-426.000.
Clarion Co., Ltd.: *See*—
Teraguchi, Yuji; and Endo, Sadayoshi, 4,574,322, Cl. 360-74.100.
Clark, Brian; and Huchital, Gerald S., to Schlumberger Technology Corporation. Electromagnetic logging with reduction of spurious transverse magnetic components. 4,574,242, Cl. 324-338.000.
Clark Equipment Company: *See*—
Chichester, Willard L., 4,573,319, Cl. 60-422.000.
Clark, Fred C.: *See*—
Gardner, Robert P., 4,573,434, Cl. 119-77.000.
Clarke, John A., to U.S. Philips Corporation. Projection lens system. 4,573,769, Cl. 350-432.000.
Clausin, Pierre, to Proengin S.A. Sail shortening roller for sailing boats. 4,573,424, Cl. 114-106.000.
Clavarino, Amedeo: *See*—
Biraghi, Giuseppe; Clavarino, Amedeo; Roth, Ferdinando; and Tarquini, Michele, 4,573,748, Cl. 312-7.200.
Clayton, James L., to Boeing Company, The. Fire-safe aircraft waste disposal system. 4,573,650, Cl. 244-118.500.
Cleemput, Camiel D. E.; and Coussement, Hedwig L. Z., to International Standard Electric Corporation. Screen printing device. 4,573,406, Cl. 101-127.100.
Clemens, Donald W., to Rotor Tool Company, The. Gear reversing mechanism for power tools. 4,573,370, Cl. 74-337.500.
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., to Padley & Venables Limited. Pick and the combination of a pick and holder. 4,573,744, Cl. 299-81.000.
Clifford, Andrew W.: *See*—
Booth, Stuart E.; Clifford, Andrew W.; and Parratt, Noel J., 4,573,517, Cl. 164-61.000.
Cloutier, Donald C., to M/A-COM, Inc. Polarized signal receiving apparatus. 4,574,258, Cl. 333-21.00A.
Coats, Montgomery R.; and Holt, Dawn E., to Fife Corporation. Method and apparatus for monitoring the manufacture of a two-component web. 4,574,194, Cl. 250-308.000.
Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Process for coating substrates with aqueous polymer dispersions. 4,573,429, Cl. 118-322.000.
Cobbs, Walter H., Jr.; Huddleston, Robert J.; and Guldner, Robert A., to Nordson Corporation. Continuous coater solvent recovery process. 4,574,005, Cl. 55-48.000.
Cochran, John P.; and Macemon, Herbert J., to Kuhlman Corporation. Transformer bushing. 4,573,757, Cl. 339-126.0RS.
Cochran, Robert. Fluid flow control system. 4,573,327, Cl. 62-238.600.
Cochran, Ronald R., to Varian Associates, Inc. Bakeable electromagnets. 4,574,261, Cl. 335-299.000.
Cohen, Marvin M.; and Payne, Francis L., to Burr-Brown Corporation. Heat sink for dissipating heat generated by electronic displays. 4,574,330, Cl. 361-388.000.
Cohen, Michael A. Video shelving. 4,573,588, Cl. 211-41.000.
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Karami, Hamzeh; and Delvaux, Myriam, 4,573,989, Cl. 604-381.000.
Shymon, Stephen J., 4,574,081, Cl. 424-52.000.
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Voorhees, Kent J.; and Klusman, Ronald W., 4,573,354, Cl. 73-432.00R.
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Baker, Ralph; and Lifshitz, Ran, 4,574,083, Cl. 424-93.000.
Colt Industries Operating Corp.: *See*—
Corrette, Richard H., 4,573,376, Cl. 76-107.00R.
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Ross, Malcolm F.; and Visner, Sidney, 4,574,069, Cl. 376-267.000.
Commonwealth of Australia, The: *See*—
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Compaq Computer Corporation: *See*—
Roberts, Kenneth B., 4,574,279, Cl. 340-731.000.
Conaway, Donald E., Jr.; and Jost, Ernest M., to Checon Corporation. Method of making electrical contacts. 4,573,265, Cl. 29-879.000.
Conner, David E.: *See*—
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Connery, Colin A. Axial lead component package with wax retaining mechanism. 4,573,574, Cl. 206-328.000.
Conoco Inc.: *See*—
Fenton, Jeff T., 4,574,158, Cl. 549-347.000.
Conque, Louis J.: *See*—
Mayon, Allen J., 4,573,682, Cl. 273-148.00B.
Conrad, Raymond W., to United States of America, Army. Wide field-of-view laser spot tracker. 4,574,191, Cl. 250-203.00R.
Conta, Robert L.; and Wallach, Harvey N., to United States Surgical Corporation. Hollow body organ stapling instrument and disposable cartridge employing relief vents. 4,573,468, Cl. 128-305.000.
Container Corporation of America: *See*—
Kohler, Karl A.; and House, Richard F., 4,573,634, Cl. 229-38.000.
Udell, Theodore H., 4,573,605, Cl. 220-304.000.
Contraves AG: *See*—
Arndt, Klaus; and Sanvido, Saverio, 4,573,773, Cl. 350-541.000.
Cookson, Leonard A. Trays. 4,573,729, Cl. 294-158.000.
Cooper, David G.; and Sach, George S., to Smith Kline & French Laboratories Limited. Pyridine derivatives histamine H_2-antagonists. 4,574,126, Cl. 514-318.000.
Cooper, Kenneth: *See*—
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Coppin, William P.; and Karabin, Tadeusz, to Maxon Corporation. Low oxygen and low pressure drop burner. 4,573,907, Cl. 431-351.000.
Coppola, Vincent G.; Lorenzo, John L.; Grisgraber, Edwin G.; and Manduley, Flavio M., to Pitney Bowes Inc. Drop shipment mailing system. 4,574,352, Cl. 364-466.000.
Cordis Corporation: *See*—
Bournay, Frederick M., Jr.; and Giurtino, Joel F., 4,573,766, Cl. 350-345.000.
Hess, Stanley R., 4,573,473, Cl. 128-642.000.
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Bonzo, Roy T., 4,573,896, Cl. 425-125.000.
Scherer, George W., 4,574,063, Cl. 264-60.000.
Corrette, Richard H., to Colt Industries Operating Corp. Method of producing thread rolling die. 4,573,376, Cl. 76-107.00R.
Cortesi, Paolo; Donati, Gianni; and Saggese, Giuseppe, to Montedison S.p.A. Process and apparatus for preparing monodispersed, spherical, non-agglomerated metal oxide particles having a size below one micron. 4,574,078, Cl. 423-592.000.
Cortopassi, Jeffery J., to Taco Bell. Taco support. 4,573,570, Cl. 206-45.330.
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Covey, Joel P.; and Zerbel, Allen J. Analytical instrument optical element support system. 4,573,794, Cl. 356-346.000.
Cox, Herbert M., to AT&T Bell Laboratories. Deposition technique. 4,574,093, Cl. 427-86.000.
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Wilkinson, Samuel C. W., 4,573,691, Cl. 277-96.100.
Crawford, A. Gerrit. Bladder-type syringe. 4,573,977, Cl. 604-212.000.
Creekmore, Thomas D. Lingual orthodontic appliance system for edgewise therapy. 4,573,913, Cl. 433-17.000.
Crepinsek, Alois. Deadbolt lock adjustable for mounting in doors of various thicknesses. 4,573,334, Cl. 70-451.000.
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Crews, James E.; and Rodriguez, George H., to Sprague Electric Company. Self regulating PTCR heater. 4,574,187, Cl. 219-541.000.
Cristol, Benoit; and Mordini, Jacques, to Aluminum Pechiney. Process for the production of aluminum trihydroxide having a medium of less than 4 microns, which can be varied as required. 4,574,074, Cl. 423-124.000.
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Frazee, Rivan F., 4,573,747, Cl. 308-3.00A.
Roman, Horst L., 4,573,566, Cl. 198-461.000.
Crossland, William A.; Peters, Jack R.; Ross, Peter W.; and Ayliffe, Peter J., to International Standard Electric Corporation. Coherent light image generation. 4,574,282, Cl. 340-784.000.
Crossmore, Edward Y., Jr. Removal of undesirable substances from finely divided particles. 4,574,045, Cl. 209-11.000.
Crow, Granville; Renger, Larry H.; and Sweet, Roger H., to Mattel, Inc. Ball swinging toy vehicle. 4,573,944, Cl. 446-465.000.
Crowe, Curtis W.; and Maddin, Charles M., to Dowell Schlumberger Incorporated. Method for preventing the precipitation of ferric

compounds during the acid treatment of wells. 4,574,050, Cl. 252-8.55C.

Crown Zellerbach Corporation: *See*—
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Cruse, Teddy H.: *See*—
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Cuir, Gerard: *See*—
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Cuir, Jean P.; and Cuir, Gerard. Feed guide stops for positioning sheet products. 4,573,677, Cl. 271-236.000.

Cull, Ronald C.; Hartman, Robert A.; and Koch, Paul E., to Standard Oil Company, The. Flexible, rollable photovoltaic cell module. 4,574,160, Cl. 136-245.000.

Cummings, Lowell O., to Chemcrete International. Epoxy curing agents and method for making them. 4,574,145, Cl. 525-509.000.

Cummins Engine Company, Inc.: *See*—
Kasting, Edward W., 4,573,439, Cl. 123-195.00A.

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d'Alayer de Costemore d'Arc, Stephane M. A., to Staar S.A. Locking device for record player apparatus. 4,574,372, Cl. 369-244.000.

D'Amico, Dennis. Measuring device for use in remote locations. 4,573,270, Cl. 33-143.00K.

Dan-Pal: *See*—
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Danfoss A/S: *See*—
Hellegaard, Kjeld; and Doktor, Hans, 4,574,341, Cl. 363-56.000.
Romer, Bendt W., 4,573,881, Cl. 417-312.000.

Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., to International Business Machines Corporation. Apparatus for compressing and buffering data. 4,574,351, Cl. 364-200.000.

Daniel, Vernon T.; Johnson, James R.; and Robbins, Edward J., to Burlington Industries, Inc. Method and apparatus for obtaining a nozzle velocity profile of a tenter oven. 4,573,353, Cl. 73-198.000.

d'Argembeau, Etienne Y. Device for cleaning the proximal faces of teeth. 4,573,920, Cl. 433-141.000.

Data Measurement Corporation: *See*—
Gignoux, Dominique; and Murray, Russell, 4,574,387, Cl. 378-56.000.

Datapoint Corporation: *See*—
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Datascope Corporation: *See*—
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Datta, Amitava: *See*—
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Daudi, Anwar R., to Motor Wheel Corporation. Method of wheel manufacture for correcting rotational non-uniformity of a pneumatic tire and wheel assembly, apparatus for performing such method and resulting wheel. 4,573,338, Cl. 72-333.000.

Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., to General Electric Company. Lighting unit. 4,574,219, Cl. 315-49.000.

Dawson, Christopher: *See*—
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Dayton, Douglas C.; LaCount, Clifford E.; and McConchie, Burton G., to Wang Laboratories, Inc. Light arrangement for scanner-digitizer. 4,574,318, Cl. 358-285.000.

Deallenbach, Robert E.: *See*—
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Deem, Brian C.; and Hall, John L., to Allied Corporation. Drive mechanism. 4,573,561, Cl. 192-91.00A.

Deere & Company: *See*—
Ehrecke, Kevin L.; Braet, Jerome A.; and Bassett, James H., 4,573,308, Cl. 56-14.400.
Hoch, John J.; and Stricker, David K., 4,573,544, Cl. 180-68.100.
Johnson, Stanley J.; and Gold, Gary L., 4,573,849, Cl. 414-334.000.

de Freitas, Elias M., to Termolar S/A. Sealing and top-drainage improvement in mechanical device to transfer liquids from containers. 4,573,613, Cl. 222-213.000.

DeHart, Arnold O.; and Symons, James D., to General Motors Corporation. Sealing surface and method. 4,573,690, Cl. 277-1.000.

Dehnke, Mary K.: *See*—
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Deighton, Guy A.; and Moore, Gerry W., to International Business Machines Corporation. Variable size circular aperture camera. 4,573,779, Cl. 354-4.000.

DeLand, Daniel L., to Alma Products Company. Clutch disc assembly. 4,573,562, Cl. 192-106.200.

Del Fabro, Giorgio: *See*—
Del Fabro, Marcello; and Del Fabro, Giorgio, 4,573,246, Cl. 29-252.000.

Del Fabro, Marcello; and Del Fabro, Giorgio, to SAE-Societa Automatismi Elettonici s.r.l. Pincers for the extraction of metal rods from bundles. 4,573,246, Cl. 29-252.000.

Delhaes, Johannes C., to Rubber- en Kunststoffabriek ENBI, B. V. Transport roller, especially for transporting paper. 4,573,563, Cl. 193-37.000.

Dell-Star Corporation: *See*—
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Della Fave, Nicholas I.: *See*—
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Dellinger, Thomas B.; Hoppe, Eugene A.; and Jones, Charles E., to Mobil Oil Corporation. Method for drilling deviated wellbores. 4,573,540, Cl. 175-61.000.

Delony, Timothy E.; and Chu, Daniel Y. M., to Bio-Rad Laboratories, Inc. Apparatus for vertical gel electrophoresis. 4,574,040, Cl. 204-299.00R.

DeLuca, Michael A.; and McCormack, John F., to Kollmorgen Technologies Corporation. Metallization of ceramics. 4,574,094, Cl. 427-96.000.

Delvaux, Myriam: *See*—
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Demaison, Gerard J.; and Kaplan, Isaac R., to Chevron Research Company. Predicting hydrocarbon potential of an earth formation underlying a body of water by analysis of seeps containing low concentrations of carbonaceous gases. 4,574,118, Cl. 436-29.000.

DeMarche, Thomas E.: *See*—
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Denley, Ronald S., to Oak Industries Inc. Keyboard auxiliary bearing. 4,574,171, Cl. 200-340.000.

Dennis, Victor S. Adjustable pass-through joint. 4,573,823, Cl. 403-118.000.

Denter, Ulrich; and Schulein, Rolf-Gunter, to Leifheit AG. Kitchen utensil for cutting of food. 4,573,387, Cl. 83-856.000.

deRojas, Edward: *See*—
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De Rossi, Ivo. Automatic contact-pin setting apparatus for testing an "off-grid" printed circuit. 4,573,263, Cl. 29-741.000.

Dervan, Andrew H.: *See*—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,574,146, Cl. 525-530.000.

DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX-Pentronix, Inc. Adjustable die and punch assembly for compacting powder material. 4,573,895, Cl. 425-78.000.

deSilva, Sunil G.; and Hearp, Charles W., to Westinghouse Electric Corp. Process for removing dissolved oxygen from water using hydrazine. 4,574,071, Cl. 422-14.000.

Devaney, Howard F., to United States of America, Energy. Multiple-stage integrating accelerometer. 4,574,168, Cl. 200-61.530.

Deve, Vagn, to Combustion Engineering, Inc. Sand reclamation system embodying a combination thermal reclaimer and sand-to-sand heat exchanger apparatus. 4,573,417, Cl. 110-236.000.

de Wild, Willem R.: *See*—
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Eijkelenkamp, Antonius J. H.; de With, Gijsbertus; and de Wild, Willem R., 4,574,329, Cl. 361-321.000.

DeWoolfson, Bruce H.; Flowers, Stanley; and Freund, Robert F., to Environmental Products Corporation. Glass bottle collection and crushing apparatus. 4,573,641, Cl. 241-36.000.

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Dilworth, James L.; and Brinks, Robert J., to Nubs Nob, Inc. Method and apparatus for making artificial snow. 4,573,636, Cl. 239-2.00S.

Dinstuhl, Klaus: *See*—
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Di Vincenzo, Serge: *See*—
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Dobler, Klaus: *See—*
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Dobson Park Industries Plc.: *See—*
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Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, to Electricite de France. Method for tapping into tubing under a controlled atmosphere, in particular for tubing in a nuclear power station. 4,573,628, Cl. 228-170.000.
Doktor, Hans: *See—*
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Dolkart, Ralph E.; and Kartinos, Nicholas J., to Baxter Travenol Laboratories, Inc. Method for using dialysis solution containing glycerol. 4,574,085, Cl. 424-148.000.
Domanowski, Gregory E.: *See—*
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Donachy, James H.: *See—*
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Donati, Gianni: *See—*
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Donn Incorporated: *See—*
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Donnelly, Stephen E.: *See—*
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Donomoto, Tadashi; Tanaka, Atsuo; and Katou, Shinji, to Toyota Jidosha Kabushiki Kaisha. Method for forming metal base composite. 4,573,519, Cl. 164-97.000.
Donovan, David A.: *See—*
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Donovan, James G., to Albany International Corp. Penetration resistant textile panels with plies of nylon and plies of Kevlar. 4,574,105, Cl. 428-233.000.
Dorey, John K., II; Huneke, James T.; Madsen, Bruce S.; and Schaaf, Theodore F., to AT&T Technologies, Inc. Additive processing electroless metal plating using aqueous photoresist. 4,574,031, Cl. 156-655.000.
Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., to AMP Incorporated. Apparatus for force fitting components into a workpiece. 4,573,262, Cl. 29-739.000.
Dorst, Hans G.: *See—*
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Dow Corning Corporation: *See—*
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Dresser Industries, Inc.: *See—*
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Dubach, Werner F., to Alfatechnic AG. Snap closure for a container. 4,573,600, Cl. 215-237.000.
DuBois, Chester G., to Outboard Marine Corporation. Electrical fluid pumping device including first and second pumping portions. 4,573,932, Cl. 440-88.000.
Ducos, Michel, to Sarl Photosysteme. Automatic developer/printer apparatus for obtaining photographic prints from a negative. 4,573,790, Cl. 355-28.000.
DuFrene, Clement O., to Rosenmeier, Gordon, a part interest. Rotary fluid device with axially sliding vanes. 4,573,892, Cl. 418-219.000.
Dukes, John N.; and Merrick, Edwin B., to Hewlett-Packard Company. Receiving radiation from loops in a common plane for monitoring hospital patients leadlessly. 4,573,475, Cl. 128-653.000.
Dumortier, Thierry M., to Fabrique Nationale Herstal, en abrege FN, Societe Anonyme. Device for adjusting the step of the mast of a sailboard or similar. 4,573,423, Cl. 114-91.000.
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Kamstra, Paulus R., 4,573,972, Cl. 604-191.000.
Durkow, Carl J., to TRW Inc. Tool means for severing an optical fiber. 4,573,617, Cl. 225-96.000.
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Eberle, Jurg, to Feramatic AG. Monorail transport system. 4,573,413, Cl. 104-120.000.
Eck, Leonard F., to Hein-Werner Corporation. Connector for a vehicle measuring system. 4,573,273, Cl. 33-180.0AT.
Eckardt, Rudolf; and Frielingsdorf, Horst. Machine for boring a plate workpiece. 4,573,835, Cl. 408-37.000.
Eckelberry, Jim: *See—*
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EcoEnergy I, Ltd.: *See—*
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Edeco Holdings Limited: *See—*
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Edwards, Neil A.; Holmes, James C.; and Wales, Denis I., to Raychem Corporation. Apparatus and method for applying sleeves to pipe. 4,574,023, Cl. 156-187.000.
Edwards, Philip N.; and Large, Michael S., to Imperial Chemical Industries PLC. 4,4'-Alkylenedipiperidine derivatives. 4,574,123, Cl. 514-210.000.
Egan, Michael J.; and Quill, Gary J., to Williams International Corporation. Integral bladed disk. 4,573,876, Cl. 416-213.00R.
Egerer, Gary M.: *See—*
Heilman, Nikolaus J.; Wix, David A.; and Egerer, Gary M., 4,573,902, Cl. 425-543.000.
Eguchi, Shinsuke, to Nissan Motor Co., Ltd. Clutch drum for multiple plate clutch assembly. 4,573,560, Cl. 192-87.100.
Ehle, Ray G., to GTE Products Corporation. Apparatus for coupling a first member to a second member. 4,573,824, Cl. 403-322.000.
Ehrecke, Kevin L.; Braet, Jerome A.; and Bassett, James H., to Deere & Company. Harvesting platform with a floating cutterbar. 4,573,308, Cl. 56-14.400.
Eijkelenkamp, Antonius J. H.; de With, Gijsbertus; and de Wild, Willem R., to U.S. Philips Corporation. Multilayer ceramic capacitor. 4,574,329, Cl. 361-321.000.
Electricite de France: *See—*
Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, 4,573,628, Cl. 228-170.000.
Eli Lilly and Company: *See—*
Hargrove, William W.; Harris, Dale C.; Akers, Michael J.; and Sperry, Charles R., 4,573,967, Cl. 604-56.000.
Elliott Turbomachinery Co., Inc.: *See—*
Moussa, Zaher M., 4,573,870, Cl. 415-202.000.
Ellis, Jeffrey, to Bristol-Myers Company. Clip strip display unit. 4,573,590, Cl. 211-86.000.
Emani, Raghuram J.: *See—*
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., 4,573,865, Cl. 415-115.000.
Emery, Leslie M. Manual tool for shaping horseshoes. 4,573,339, Cl. 72-384.000.
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, to General Electric Company. Captured radial key for steam turbine wheels. 4,573,875, Cl. 416-198.00A.
Endo, Itaru; and Inoue, Yasuo, to Olympus Optical Co., Ltd. Inverted-design microscope. 4,573,772, Cl. 350-526.000.
Endo, Sadayoshi: *See—*
Teraguchi, Yuji; and Endo, Sadayoshi, 4,574,322, Cl. 360-74.100.
Endres, Dan D.; and Matray, Attila, to Kimberly-Clark Corporation. Soft moisture resistant tissue product. 4,574,021, Cl. 156-152.000.

Endress u. Hauser GmbH u. Co.: *See—*
Maier, Winfried, 4,574,328, Cl. 361-284.000.
Energy Innovations, Inc.: *See—*
Gourdine, Meredith C., 4,574,092, Cl. 427-33.000.
Eng, Kai Y.; and Haskell, Barin G., to AT&T Bell Laboratories. Synchronization technique for non-colocated TV signals in a TDMA satellite communication system. 4,574,379, Cl. 370-104.000.
Engineered Data Products, Inc.: *See—*
Atkinson, Walter E., 4,573,589, Cl. 211-41.000.
Enscore, David J.: *See—*
Chen, Yu-Ling; Chun, Leslie L.; and Enscore, David J., 4,573,995, Cl. 604-896.000.
Entringer, David C.; Gruenwald, David J.; and Felix, Dale K., to Brunswick Corporation. Exhaust elbow for marine propulsion system. 4,573,318, Cl. 60-310.000.
Environmental Products Corporation: *See—*
DeWoolfson, Bruce H.; Flowers, Stanley; and Freund, Robert F., 4,573,641, Cl. 241-36.000.
Environmental Research Institute of MI: *See—*
Holsztynski, Wlodzimierz; and Wilson, Stephen S., 4,574,394, Cl. 382-41.000.
Erickson, Kim L. Measuring device for maxillofacial trial surgery. 4,573,917, Cl. 433-75.000.
Erkomat Oy: *See—*
Rosenstrom, Pertti, 4,573,504, Cl. 141-59.000.
Erwin Muller GmbH & Co.: *See—*
Muller, Erwin; Zakrzewski, Czeslaw; and Matzdorf, Burghard, 4,573,624, Cl. 227-121.000.
Essilor International Cie Generale d'Optique: *See—*
Boudet, Jean; and Rolland, Guy, 4,573,903, Cl. 425-555.000.
Ethicon, Inc.: *See—*
Golden, Donald M.; and McVay, William P., 4,573,469, Cl. 128-334.00C.
Ets. Ch. Scareder & Fils: *See—*
Henriot, Pierre A., 4,574,036, Cl. 203-39.000.
Etude et Development en Metallurgie: *See—*
Merrien, Pierre L.; and Merrien, Pierre A., 4,573,522, Cl. 164-456.000.
Evans, John C.: *See—*
McLachlan, Richard D.; Jewett, Gary L.; and Evans, John C., 4,573,761, Cl. 350-96.240.
Exacta S.p.A.: *See—*
Peloggio, Alessandro, 4,573,419, Cl. 112-27.000.
Extracorporeal Medical Specialties, Inc.: *See—*
Goss, Jack, 4,573,960, Cl. 604-6.000.
King, Martin J., 4,573,961, Cl. 604-6.000.
Troutner, Vernon H., 4,573,884, Cl. 417-374.000.
Troutner, Vernon H., 4,573,962, Cl. 604-6.000.
Ezaki, Yoshihiro: *See—*
Aishima, Takanori; Utsumi, Makoto; and Ezaki, Yoshihiro, 4,574,104, Cl. 428-220.000.
Ezekoye, Levi I., to Westinghouse Electric Corp. Valve packing leakage monitoring device. 4,573,344, Cl. 73-46.000.
F. J. Kerrigan Plumbing Co.: *See—*
Kerrigan, Jerome J.; and Domanowski, Gregory E., 4,573,802, Cl. 366-152.000.
Faber, Thomas J.: *See—*
Svyatsky, Eduard; Rabindran, K. George; and Faber, Thomas J., 4,573,675, Cl. 271-122.000.
Fabrique Nationale Herstal, en abrege FN, Societe Anonyme: *See—*
Dumortier, Thierry M., 4,573,423, Cl. 114-91.000.
Faiveley Entreprises: *See—*
Favrel, Michel; and Penanhoat, Jean-Francois, 4,573,286, Cl. 49-214.000.
Fakirov, Stoyko C.; and Schultz, Jerold M., to University of Delaware. Fiber reinforced composite. 4,574,108, Cl. 428-292.000.
Fan, Robert J.; and Visser, Teunis. Connector system for a single optical fiber. 4,573,760, Cl. 350-96.210.
Favaro, Lori. Protective covering for portable audio devices. 4,573,573, Cl. 206-305.000.
Favrel, Michel; and Penanhoat, Jean-Francois, to Faiveley Entreprises. Device for suspending and guiding a movable panel, in particular for an oblique-displacement sliding door. 4,573,286, Cl. 49-214.000.
Featherstone, John L.: *See—*
Gritters, Gregory A.; Nellis, Walter E.; and Featherstone, John L., 4,573,803, Cl. 366-167.000.
Fecker, Rainer: *See—*
Lehmann, Werner; Fecker, Rainer; and Fuss, Manfred, 4,573,672, Cl. 270-45.000.
Feig, Edwin R.: *See—*
Carville, Donna B.; Feig, Edwin R.; Rose, Gene D.; and Pulliam, Mary H., 4,573,488, Cl. 137-13.000.
Feldman, David G.; and France, Hubert M., Jr., to TRW Inc. Communication bus interface unit. 4,574,284, Cl. 340-825.520.
Feldman, Louis W.: *See—*
Noon, George P.; Feldman, Louis W.; and Peterson, Julia A., 4,573,883, Cl. 417-394.000.
Felix, Dale K.: *See—*
Entringer, David C.; Gruenwald, David J.; and Felix, Dale K., 4,573,318, Cl. 60-310.000.
Felix, Willi, to Jos. Hunkeler Ltd. Apparatus for folding and stacking of continuous web in zigzag arrangement. 4,573,670, Cl. 270-39.000.
Fenton, Jeff T., to Conoco Inc. Acetal purification using phase transfer catalysts. 4,574,158, Cl. 549-347.000.
Feramatic AG: *See—*
Eberle, Jurg, 4,573,413, Cl. 104-120.000.
Ferrando, William, to United States of America, Navy. Suspension method of impregnating active material into composite nickel plaque. 4,574,096, Cl. 427-126.600.
Ferrari, James M.: *See—*
Rado, George T.; Vittoria, Carmine; and Ferrari, James M., 4,574,259, Cl. 333-157.000.
Ferrari, Serge, to Tissage et Enduction Serge Ferrari S.A. Method of producing a coated fabric. 4,574,107, Cl. 428-259.000.
Feurer-Zogel, Rudolf; and Vogler, Rudolf, to Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG. Running sole for shoes, especially sports shoes, with adjustable heel cushioning. 4,573,279, Cl. 36-35.00R.
Field, Nathaniel L.: *See—*
Abramson, Robert D.; Donovan, David A.; and Field, Nathaniel L., 4,573,348, Cl. 73-118.000.
Fife Corporation: *See—*
Coats, Montgomery R.; and Holt, Dawn E., 4,574,194, Cl. 250-308.000.
Figari, Andres G. Method of casting floors and ceilings of buildings and a panel for use therein. 4,573,303, Cl. 52-743.000.
Figge, Dieter: *See—*
Artz, Gerd; and Figge, Dieter, 4,573,521, Cl. 164-451.000.
Figueras, Michel. Horse hoof-shoeing sole plate. 4,573,538, Cl. 168-14.000.
Fillmore, William E., to Owens-Illinois, Inc. Child resistant package with tamper indicating band. 4,573,599, Cl. 215-225.000.
Finike Italiana Marposs S.p.A.: *See—*
Golinelli, Guido; and Possati, Mario, 4,573,272, Cl. 33-172.00E.
Finnegan, Danny. Mounting chuck for a drill having reversible tools therein. 4,573,839, Cl. 408-239.00R.
Finney, Roy P., to Medical Engineering Corp. Urinary collection method and device. 4,573,985, Cl. 604-349.000.
Fischell, Robert E.; and Lord, Peter C., to Johns Hopkins University, The. Refillable medication infusion apparatus. 4,573,994, Cl. 604-891.000.
Fisher, Michael H.; and Jacks, Thomas M., to Merck & Co., Inc. Naphtho-[1,2-b]-quinolizium derivatives as antidiarrheal agents. 4,574,125, Cl. 514-284.000.
Fite, F. Bartow: *See—*
Holcomb, David A.; and Tryon, James A., 4,573,244, Cl. 241-169.000.
Flaten, James F., to Tobin-Arp Manufacturing Company. Longitudinal feed attachment for a boring bar. 4,573,837, Cl. 408-111.000.
Fleming, John H. Drain shield for eave gutters. 4,573,290, Cl. 52-12.000.
Flemming, Edgar J.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.
Flo-Con Systems, Inc.: *See—*
Shapland, Earl P., 4,573,616, Cl. 222-600.000.
Flowers, Stanley: *See—*
DeWoolfson, Bruce H.; Flowers, Stanley; and Freund, Robert F., 4,573,641, Cl. 241-36.000.
FMC Corporation: *See—*
Castrantas, Harry M., 4,574,076, Cl. 423-224.000.
Mory, Steven W.; and Lotto, Ronald L., 4,573,955, Cl. 493-204.000.
Fohl, Artur, to Repa Feinstanswerk GmbH. Driving device especially for return stiffening of a safety belt in an automatic safety belt windup device. 4,573,322, Cl. 60-638.000.
Folland, Rickworth: *See—*
Adams, John F. E.; Proffit, Philip J. G.; Oakley, Nicholas R.; and Folland, Rickworth, 4,573,597, Cl. 215-12.00R.
Fontana, Ludovico, to Tecnovar Italiana S.p.A. Box distributor for sequentially discharging objects from aircraft and landcraft means. 4,573,393, Cl. 89-1.590.
Forbes, Alexander E.; and Haslam, John L., to Merck & Co., Inc. Eye frame ophthalmic drug delivery device. 4,573,982, Cl. 604-300.000.
Forbo-Teppichwerk AG: *See—*
Meroni, Rico, 4,573,299, Cl. 52-513.000.
Ford Aerospace and Communications Corp.: *See—*
Morenus, Richard C.; and Frazer, Alson C., 4,573,648, Cl. 244-3.220.
Ford Motor Company: *See—*
Abramson, Robert D.; Donovan, David A.; and Field, Nathaniel L., 4,573,348, Cl. 73-118.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,574,146, Cl. 525-530.000.
Ford, Ronald R. Snow scraper for ski boots. 4,573,710, Cl. 280-813.000.
Formosa Plastics Corporation: *See—*
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Wo, Chee-Yuan, 4,574,141, Cl. 525-252.000.
Fosnaught, Harold R., to Owens-Illinois, Inc. Apparatus and method for wrapping a plastic label around a container. 4,574,020, Cl. 156-80.000.
Foster, John K.: *See—*
Tricca, Raymond A.; and Foster, John K., 4,574,101, Cl. 428-138.000.
Fournier, Pascal; and Peraud, Jean-Claude, to Pont A Mousson S.A. Apparatus for rapid tempering a metal or alloy on a moving belt. 4,573,520, Cl. 164-253.000.
Foust, Jeffrey L.: *See—*
Huffman, Charles E.; and Foust, Jeffrey L., 4,574,385, Cl. 377-107.000.

Foy, Martin, to Morganite Ceramic Fibres Limited; and Insulated Chimneys (Trim) Limited, a part interest. Insulated chimney pipes. 4,573,400, Cl. 98-60.000.

Frama AG: *See—*
Haug, Werner, 4,573,673, Cl. 271-111.000.

Frame, Robert R., to UOP Inc. Metal chelate mercaptan oxidation catalyst. 4,574,121, Cl. 502-163.000.

Frampton, Jeffery A.; and Bartman, Nicholas, to Idex (Jersey) Limited. Hinge assembly. 4,573,735, Cl. 296-218.000.

France, Hubert M., Jr.: *See—*
Feldman, David G.; and France, Hubert M., Jr., 4,574,284, Cl. 340-825.520.

Frank, Hubertus; and Gebauer, Rainer, to INA Walzlager Schaeffler KG. Lip seal with elastic attaching band. 4,573,692, Cl. 277-152.000.

Franks, Terry E., to Square D Company. Snap acting solenoid operated reset latch mechanism. 4,574,260, Cl. 335-18.000.

Frazee, Rivan F., to Cross Company, The. Apparatus for aligning a machine tool saddle. 4,573,747, Cl. 308-3.00A.

Frazer, Alson C.: *See—*
Morenus, Richard C.; and Frazer, Alson C., 4,573,648, Cl. 244-3.220.

Frei, Linae. Jewelry display. 4,573,585, Cl. 211-13.000.

Freund, Robert F.: *See—*
DeWoolfson, Bruce H.; Flowers, Stanley; and Freund, Robert F., 4,573,641, Cl. 241-36.000.

Friedel, Bernard G. Horticultural aid. 4,573,310, Cl. 56-329.000.

Frieder, Philip M.; and deRojas, Edward, to Optical Systems International Inc. Biconvex aphakic prosthetic lens. 4,573,776, Cl. 351-167.000.

Friedli, Hans; and Gut, Edwin, to Swiss Aluminium Ltd. Process for attaching anode blocks to an anode suspension means. 4,574,019, Cl. 156-73.600.

Friedman, Emil M.: *See—*
Sandstrom, Paul H.; and Friedman, Emil M., 4,574,140, Cl. 525-123.000.

Frielingsdorf, Horst: *See—*
Eckardt, Rudolf; and Frielingsdorf, Horst, 4,573,835, Cl. 408-37.000.

Frimer, Itzchak, to Orlite Engineering Ltd. Lighted gun sights. 4,574,335, Cl. 362-84.000.

Frisbie, Jeffrey S.: *See—*
Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,573,470, Cl. 128-344.000.

Frist, Brian S.; and Lazarus, Wayne H. Protective shield for needle receiver. 4,573,975, Cl. 604-192.000.

Frobose, James W., to Jasper Corporation, The. Upholstered seat for clean room. 4,573,740, Cl. 297-452.000.

Fuhrer, Rudolf: *See—*
Liebhardt, Josef; and Fuhrer, Rudolf, 4,573,411, Cl. 102-256.000.

Fuji Electric Co., Ltd.: *See—*
Abe, Ken-ichi; and Ozaki, Ryoji, 4,574,170, Cl. 200-153.00G.

Fuji Electric Corporate Research & Development Co., Ltd.: *See—*
Shiraishi, Hideo, 4,574,042, Cl. 204-429.000.

Fuji Photo Film Co., Ltd.: *See—*
Adachi, Keiichi; Ikeda, Tadashi; and Tani, Tadaaki, 4,574,115, Cl. 430-522.000.
Arakawa, Satoshi; Matsuda, Terumi; Ishizuka, Akio; and Shibahara, Yoshihiko, 4,574,102, Cl. 428-212.000.
Kobayashi, Kesanao; Toyama, Tadao; and Yoshida, Susumu, 4,573,782, Cl. 354-299.000.
Konishi, Masahiro, 4,574,319, Cl. 358-335.000.
Teraoka, Masanori; and Matsuda, Terumi, 4,574,195, Cl. 250-327.200.

Fuji Photo Optical Co., Ltd.: *See—*
Arakawa, Satoshi, 4,573,450, Cl. 128-6.000.
Sato, Susumu; and Oshima, Hideharu, 4,573,780, Cl. 354-195.120.

Fuji Xerox Co., Ltd.: *See—*
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,574,293, Cl. 364-76.0PH.
Kato, Hiroshi, 4,574,395, Cl. 382-61.000.
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,574,281, Cl. 340-783.000.

Fujie, Hideo; and Togashi, Kousaku, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for measuring pattern area percentage for engraving films. 4,573,798, Cl. 356-432.000.

Fujii, Kazuyoshi: *See—*
Okamoto, Hidemasa; Yamanaka, Mitsuo; and Fujii, Kazuyoshi, 4,574,154, Cl. 544-192.000.

Fujii, Shuzo; Shimada, Yuzo; Utsumi, Kazuaki; and Saito, Yutaka, to NEC Corporation. MMC Substrate including capacitors having perovskite structure dielectric and electrical devices including MMC substrate. 4,574,255, Cl. 331-25.000.

Fujimori, Kyoichi: *See—*
Sekiguchi, Akira; Ichikawa, Takeo; Inoue, Kazuo; Fujimori, Kyoichi; Hirano, Yutaka; and Yasuhara, Seishi, 4,573,347, Cl. 73-119.00A.

Fujisaki, Kiyonori. Electric rotary device of permanent magnet type. 4,574,214, Cl. 310-154.000.

Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha; and Sumitomo Electric Industries, Ltd. Carbon fiber reinforced plastic spoke plate. 4,573,745, Cl. 301-63.0PW.

Fujisaku, Kiminori: *See—*
Mori, Shosuke; Awaga, Makoto; Fujisaku, Kiminori; Yamauchi, Mitsuru; and Ono, Hitoshi, 4,574,347, Cl. 364-200.000.

Fujitsu Limited: *See—*
Baba, Fumio, 4,574,203, Cl. 307-269.000.
Miyazaki, Sachio; and Aoki, Shinichiro, 4,574,377, Cl. 370-104.000.
Mori, Shosuke; Awaga, Makoto; Fujisaku, Kiminori; Yamauchi, Mitsuru; and Ono, Hitoshi, 4,574,347, Cl. 364-200.000.
Tanikawa, Kunihiro; and Ohtsuki, Osamu, 4,574,295, Cl. 357-24.000.

Fukaya, Kiyoshi: *See—*
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.

Fukushima, Hirotaka: *See—*
Kajitani, Kouji; and Fukushima, Hirotaka, 4,573,945, Cl. 464-68.000.

Fuller Company: *See—*
Lasso, Eugene R.; and Pitsko, John J., 4,573,800, Cl. 366-101.000.

Fulton Industries, Inc.: *See—*
Stine, Harold R., 4,574,339, Cl. 362-360.000.

Funai Electric Company Limited: *See—*
Morishima, Masaharu, 4,574,391, Cl. 381-18.000.

Funkhouser, Bernard M. Chain saw cutting table. 4,573,385, Cl. 83-788.000.

Furuya, Harumi, to Henry Mann, Inc. Apparatus for cutting and forming leads. 4,573,501, Cl. 140-147.000.

Fuss, Manfred: *See—*
Lehmann, Werner; Fecker, Rainer; and Fuss, Manfred, 4,573,672, Cl. 270-45.000.

Fust, Armin; and Starcevic, Mihailo, to BBC Brown, Boveri & Co., Ltd. Self-pumping hydrodynamic bearing. 4,573,810, Cl. 384-322.000.

G. Rau GmbH & Co.: *See—*
Stockel, Dieter; and Schneider, Friedrich E., 4,574,014, Cl. 148-11.50P.

Gaasterland, Douglas E.: *See—*
Rich, Alan H.; Gaasterland, Douglas E.; and Tedder, Thomas E., 4,573,467, Cl. 128-303.100.

Galloway, Howard R.; and Shanks, Gary, to Network Medical Containers Pty, Ltd. Environmentally controlled medication container. 4,573,581, Cl. 206-570.000.

Galson Research Corporation: *See—*
Peterson, Robert L., 4,574,013, Cl. 134-2.000.

Gardner, Robert P., to Clark, Fred C. Pet watering apparatus. 4,573,434, Cl. 119-77.000.

Garkusha, Ivan S.; Kazak, Vadim N.; and Kapralov, Valery K., to Vsesojuznoe Nauchno-Proizvod-Stvennoe Obiedinenie "Sojuzpromgaz". Method of underground gasification of coal seam. 4,573,531, Cl. 166-259.000.

Garrett Corporation, The: *See—*
Mock, Edward A., 4,573,323, Cl. 60-665.000.

Garwood, William E.: *See—*
Chester, Arthur W.; Garwood, William E.; and Vartuli, James C., 4,574,043, Cl. 208-59.000.

Gaspar, Mark S.: *See—*
Barmatz, Martin B.; Allen, James L.; and Gaspar, Mark S., 4,573,356, Cl. 73-505.000.

Gass, Gene C. Unisocket construction for front compartment of a unitized automobile body. 4,573,734, Cl. 296-189.000.

Gavras, Haralambos P.; Ryan, James W.; and Chung, Alfred. Radiolabeled angiotensin converting enzyme inhibitors for radiolabeling mammalian organ sites. 4,574,079, Cl. 424-1.100.

Gebauer, Rainer: *See—*
Frank, Hubertus; and Gebauer, Rainer, 4,573,692, Cl. 277-152.000.

Gebruder Buhler AG: *See—*
Maag, Wilhelm; and Straub, Paul, 4,573,568, Cl. 198-731.000.

Geer, Charles P.: *See—*
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.

Gehrke, Glenn F.: *See—*
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,573,947, Cl. 464-146.000.

General Dynamics Corporation/Convair Div.: *See—*
Streetman, Joe W.; and Simson, Anton K., 4,573,396, Cl. 89-36.080.

General Electric: *See—*
Chiu, Norman H.; and Schneider, David A., 4,573,325, Cl. 62-129.000.

General Electric Company: *See—*
Anderson, Thomas E., 4,574,222, Cl. 315-254.000.
Bateman, Robert L., Jr.; and Soules, Thomas F., 4,574,218, Cl. 313-635.000.
Beatty, Robert M.; Miller, Edward B.; and Huber, Paul G., 4,574,355, Cl. 364-492.000.
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,573,875, Cl. 416-198.00A.
Glascock, Homer H., II; Neugebauer, Constantine A.; and Webster, Harold F., 4,574,299, Cl. 357-81.000.
Hill, William D.; Mercanti, William A., Jr.; Apple, Christian K.; and Loomis, Gary S., 4,574,068, Cl. 376-259.000.
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., 4,573,865, Cl. 415-115.000.
Pendergrass, Edward A., 4,574,217, Cl. 313-579.000.
Port, John H.; Kukoleck, Dennis G.; and Guezuraga, Robert M., 4,574,388, Cl. 378-144.000.

Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,573,259, Cl. 29-602.00R.
Yates, John B., III; and Smith, David J., 4,574,144, Cl. 525-435.000.
General Foods Corporation: *See—*
Musto, Joseph A.; Scarella, Robert A.; Jacquett, Harold W.; Riolo, Angelo V.; and Della Fave, Nicholas L., 4,574,089, Cl. 426-386.000.
General Motors Corporation: *See—*
Campen, Lawrence E., 4,573,724, Cl. 293-136.000.
DeHart, Arnold O.; and Symons, James D., 4,573,690, Cl. 277-1.000.
Givan, David E., 4,573,364, Cl. 74-7.00E.
Gondert, Theodore R.; and MacDonald, Richard A., 4,573,730, Cl. 296-1.00S.
Hamilton, Kent R.; and Kramer, John H., 4,573,271, Cl. 33-169.00C.
LeBlanc, James C.; and LeBlanc, Richard S., 4,573,397, Cl. 89-41.120.
Ludecke, Otto A., 4,573,317, Cl. 60-303.000.
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., 4,573,842, Cl. 410-23.000.
Richard, Dennis J., 4,573,496, Cl. 137-625.210.
Shellhause, Ronald L., 4,573,249, Cl. 29-432.000.
Shellhause, Ronald L., 4,573,557, Cl. 188-216.000.
Zaydel, Wieslaw S., 4,573,733, Cl. 296-191.000.
General Signal Corporation: *See—*
Ludwig, Albert R., 4,573,498, Cl. 137-625.470.
General Tire & Rubber Company, The: *See—*
Stamper, Richard W.; and Hultz, Robert C., 4,574,103, Cl. 428-213.000.
Genereux, Paul D.; and Paulonis, Daniel F., to United Technologies Corporation. Nickle base superalloy articles and method for making. 4,574,015, Cl. 148-11.50N.
Genex Corporation: *See—*
Vollmer, Patricia J.; and Schruben, Jeffrey J., 4,574,117, Cl. 435-108.000.
Genicom Corporation: *See—*
Harris, Samuel C., Jr., 4,573,645, Cl. 242-75.470.
Gerk, Alvin P., to Minnesota Mining and Manufacturing Co. Process for improved densification of sol-gel produced alumina-based ceramics. 4,574,003, Cl. 51-309.000.
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Gibbon, John D.; Lawler, Terry E.; Yoon, Hyun-Nam; and Charbonneau, Larry F., to Celanese Corporation. Process for the expeditious formation of a high strength shaped article of poly(6-oxy-2-naphthoate-4-oxybenzoate). 4,574,066, Cl. 264-85.000.
Gibson, Galen R.; and Anstaett, Ralph E., Jr., to Dell-Star Corporation. FM Video receiver. 4,574,308, Cl. 358-188.000.
Gignoux, Dominique; and Murray, Russell, to Data Measurement Corporation. Apparatus and method for measuring thickness. 4,574,387, Cl. 378-56.000.
Gillette Company, The: *See—*
Jacobson, Chester F., 4,573,266, Cl. 30-41.000.
Gilreath, Charles T. Window index system for ring binders. 4,573,821, Cl. 402-78.000.
Gish, Larry D.: *See—*
Rothe, Charles T.; and Gish, Larry D., 4,573,495, Cl. 137-414.000.
Gisler, Roland: *See—*
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Givan, David E., to General Motors Corporation. Gear reduction starter drive. 4,573,364, Cl. 74-7.00E.
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Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,573,947, Cl. 464-146.000.
Glance, Bernard, to AT&T Bell Laboratories. Phase-lock loop circuit providing very fast acquisition time. 4,574,254, Cl. 331-17.000.
Glascock, Homer H., II; Neugebauer, Constantine A.; and Webster, Harold F., to General Electric Company. Thyristor packaging system. 4,574,299, Cl. 357-81.000.
Glaverbel: *See—*
Laroche, Pierre, 4,574,109, Cl. 428-325.000.
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Glynwed Screws & Fastenings Limited: *See—*
Golby, John B., 4,573,750, Cl. 312-38.000.
GNB Batteries Inc.: *See—*
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Goff, Charles W.; and Goff, Charles W., Jr. Machine gun. 4,573,394, Cl. 89-33.010.
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Golby, John B., to Glynwed Screws & Fastenings Limited. Dispensing apparatus. 4,573,750, Cl. 312-38.000.
Gold, Gary L.: *See—*
Johnson, Stanley J.; and Gold, Gary L., 4,573,849, Cl. 414-334.000.
Goldberg, James R. Molded safety closure device and method for making same. 4,573,602, Cl. 215-256.000.
Golden, Donald M.; and McVay, William P., to Ethicon, Inc. Two-piece tissue fastener with coinable leg staple and retaining receiver and method and instrument for applying same. 4,573,469, Cl. 128-334.00C.
Golinelli, Guido; and Possati, Mario, to Finike Italiana Marposs S.p.A. Axial movement gauging head. 4,573,272, Cl. 33-172.00E.
Gomez, I. Luis, to Monsanto Company. Plasticized polyvinyl butyral interlayers. 4,574,136, Cl. 524-310.000.
Gondert, Theodore R.; and MacDonald, Richard A., to General Motors Corporation. Drag reducing partial tonneau for pickup truck. 4,573,730, Cl. 296-1.00S.
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Small, Marc J.; and Powers, David E., 4,573,513, Cl. 160-135.000.
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Smith, William T.; Rooney, Timothy M.; and Watts, George T., 4,573,509, Cl. 152-158.000.
Gordon, Eugene I.; Hartman, Robert L.; and Nash, Franklin R., to AT&T Bell Laboratories. Purging: a reliability assurance technique for semiconductor lasers utilizing a purging process. 4,573,255, Cl. 29-574.000.
Gordon, Marvin; and Lichtenstein, Joseph, to Whitman Medical Corporation. Adjustable in-line valve for sterile fluids. 4,573,658, Cl. 251-95.000.
Goss, Jack, to Extracorporeal Medical Specialties, Inc. Three phase irradiation treatment process. 4,573,960, Cl. 604-6.000.
Goto, Shinji; Kingo, Takao; Ochi, Akira; and Yoshikawa, Yoshiro, to Nissan Shatai Company, Limited. Fuel filler system for an automotive vehicle. 4,573,694, Cl. 280-5.00A.
Gourdine, Meredith C., to Energy Innovations, Inc. Electrogasdynamic coating system. 4,574,092, Cl. 427-33.000.
GQ Defence Equipment Limited: *See—*
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Graco Metal Products Inc.: *See—*
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Granco-Clark, Inc.: *See—*
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Grant, Frederic F., to Eastman Kodak Company. Tape guide mechanism for dynamic tracking control. 4,573,619, Cl. 226-190.000.
Grathoff, Hartmut, to M.A.N. Maschinenfabrik Augsburg-Nurnberg. Bucketwheel excavator with oscillating nozzles. 4,573,743, Cl. 299-39.000.
Gray, Richard T., to Rohm and Haas Company. Rechargeable cell. 4,574,113, Cl. 429-194.000.
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Green, David T.; and Gunning, Edgar D., to United States Surgical Corporation. Surgical fastener applying apparatus with variable fastener arrays. 4,573,622, Cl. 227-19.000.
Greenberg, I. Melvin. Surgical holder for a laparoscope or the like. 4,573,452, Cl. 128-20.000.
Greminger, George K., Jr.; Hall, Richard H.; and Dehnke, Mary K., to Dow Chemical Company, The. Method and material for the restraint of polar organic liquids. 4,573,578, Cl. 206-524.400.
Griffiths, Edward E. Remote controlled crane hook coupler. 4,573,725, Cl. 294-82.280.
Grimes, John T. Gameboard apparatus with separating die. 4,573,688, Cl. 273-241.000.
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Gritton, Charles W. K., to AT&T Bell Laboratories. Tandem adaptive filter arrangement. 4,574,166, Cl. 179-170.200.
Grohoski, Jane L.; and Marinari, Diane L. Haircutting device. 4,573,267, Cl. 30-133.000.
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Grumman Aerospace Corporation: *See—*
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Grunbeck Wasseraufbereitung GmbH: *See—*
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GTE Business Communication Systems Inc.: *See—*
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GTE Products Corporation: *See—*
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Guay, Randall G.: *See*—
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Guest, John D. Tube couplings. 4,573,716, Cl. 285-323.000.
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Guim, Raul. Tilt free container. 4,573,604, Cl. 220-69.000.
Guldner, Robert A.: *See*—
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Gupte, Anil J.; and Kendall, Joyce M., to Richardson-Vicks Inc. Crackling aerosol foam. 4,574,052, Cl. 252-90.000.
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Hachtel, Hansjorg; and Dobler, Klaus, to Robert Bosch GmbH. Rotary speed measuring apparatus. 4,574,237, Cl. 324-173.000.
Hackett, Steven B. Method and means for in situ repair of heat exchanger tubes in nuclear installations or the like. 4,573,248, Cl. 29-423.000.
Hadama, Shigeyuki; and Sugizaki, Kyoichi, to Atsugi Motor Parts Co., Ltd. Vane pump with locating pins for cam ring. 4,573,890, Cl. 418-108.000.
Hadfield, Robert W.: *See*—
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Hagglund, Erik. Method and apparatus for wire drawing. 4,573,336, Cl. 72-278.000.
Haijkens, Bernardus, to U.S. Philips Corporation. Commutator end dust seal for an electric motor. 4,574,212, Cl. 310-88.000.
Halbach & Braun: *See*—
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Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Murasugi, Takashi; and Suzuki, Tadashi, to Nissan Motor Company, Limited. Control system and method for automatic transmission for automotive vehicle. 4,573,375, Cl. 74-863.000.
Hamazawa, Yoshikazu; Hirai, Tatsuro; Horikoshi, Tunenobu; and Ishida, Tomio, to Matsushita Electric Industrial Co., Ltd. Lamination-wound chip coil and method for manufacturing the same. 4,574,262, Cl. 336-192.000.
Hamilton, Kent R.; and Kramer, John H., to General Motors Corporation. Machine performance sensor. 4,573,271, Cl. 33-169.00C.
Hammarstedt, Gosta, to Arcu Armaturindustri AB. Sequentially controlled water mixer. 4,573,493, Cl. 137-315.000.
Hand, Derek G., to Rolls-Royce Limited. Housing for turbomachine rotors. 4,573,867, Cl. 415-134.000.
Hans Nussbaum: *See*—
Nussbaum, Hans, 4,573,663, Cl. 254-89.00H.
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Hansler, Richard L.: *See*—
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Hargrove, William W.; Harris, Dale C.; Akers, Michael J.; and Sperry, Charles R., to Eli Lilly and Company. Vacuum vial infusion system. 4,573,967, Cl. 604-56.000.
Harkins, Daniel J., to Thermal Design, Inc. Building insulation system. 4,573,298, Cl. 52-404.000.
Harnischfeger Corporation: *See*—
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Harris, Dale C.: *See*—
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Harris, Richard L.; and Horst, Robert W., to Tandem Computers Incorporated. Entry control store for enhanced CPU pipeline performance. 4,574,344, Cl. 364-200.000.
Harris, Samuel C., Jr., to Genicom Corporation. Ribbon tension control. 4,573,645, Cl. 242-75.470.
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Harrison, Ronald A.: *See*—
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Hartung, Michael H., to International Business Machines Corporation. Method and apparatus for peripheral data handling hierarchies. 4,574,346, Cl. 364-200.000.
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Asano, Makoto; Hasegawa, Kiyoharu; Tamura, Yukio; and Oono, Yoshihiro, 4,574,110, Cl. 428-402.210.
Hashimoto, Takaaki; Motoori, Ryuzo; and Minagawa, Kazushi, to Nippon Kogaku K.K. White balance control system for color television camera with automatic switchover control. 4,574,303, Cl. 358-29.000.
Haskell, Barin G.: *See*—
Eng, Kai Y.; and Haskell, Barin G., 4,574,379, Cl. 370-104.000.
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Haslberger, Richard: *See*—
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Hassdenteufel, Jurgen-Rolf, to Bayer Aktiengesellschaft. Process for the preparation of O-methyl-N-vinylurethane. 4,574,159, Cl. 560-157.000.
Hatagishi, Shingo, to Yoshida Kogyo K.K. Method and apparatus for feeding sliders to slider pocket for assembling sliders on an uncut fastener chain. 4,573,264, Cl. 29-766.000.
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Hattori, Yoshiyuki: *See*—
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Haug, Werner, to Frama AG. Feed mechanism for individual flat articles. 4,573,673, Cl. 271-111.000.
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Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., to GKN Automotive Components, Inc. Constant velocity universal joint. 4,573,947, Cl. 464-146.000.

Head, Manley J., to Rockwell International Corporation. QAM Demodulator automatic quadrature loop using n-m LSB's. 4,574,244, Cl. 329-50.000.
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deSilva, Sunil G.; and Hearp, Charles W., 4,574,071, Cl. 422-14.000.
Heartland Industries, Inc.: *See*—
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Hechtman, Charles D., to AT&T Technologies, Inc. High frequency test fixture. 4,574,236, Cl. 324-158.00F.
Hecker, Joel; Stern, Howard; and Heydenburg, Thomas, to Robotic Vision Systems, Inc. Beam deflection mechanism. 4,573,758, Cl. 350-3.710.
Heesch, Max O., to ITT Corporation. Manual seat recliner. 4,573,738, Cl. 297-362.000.
Hehl, Karl. Die carrier member for die closing unit of injection molding machine. 4,573,901, Cl. 425-451.000.
Heidelberger Druckmaschinen AG: *See*—
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Heilman, Nikolaus J.; Wix, David A.; and Egerer, Gary M., to Interblock Partners, Ltd. Machine for manufacturing foam building blocks. 4,573,902, Cl. 425-543.000.
Hein-Werner Corporation: *See*—
Eck, Leonard F., 4,573,273, Cl. 33-180.0AT.
Held, Kurt. Continuous-acting press with multi-layered press bands. 4,573,404, Cl. 100-151.000.
Hellegaard, Kjeld; and Doktor, Hans, to Danfoss A/S. Current supply apparatus for an A.C. consumer. 4,574,341, Cl. 363-56.000.
Hellstrom, Jerker; Tholander, Lars H. G.; and Jacobsson, Kurt A. G., to Aktiebolaget IRO. Yarn supply device group. 4,574,353, Cl. 364-470.000.
Helmer, Michael T. Easter egg dyeing and drying device. 4,573,586, Cl. 211-14.000.
Helt, Robert W.: *See*—
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Henderson, Albert S., to Harris Corporation. Rotary scan antenna. 4,574,289, Cl. 343-786.000.
Henkel, Hans-Joachim; and Muller, Norbert, to Siemens Aktiengesellschaft. Electric insulation. 4,574,111, Cl. 428-461.000.
Henriot, Pierre A., to Ets. Ch. Scareder & Fils. Method and an installation for purifying industrial waste water, particularly process water from dyeing works. 4,574,036, Cl. 203-39.000.
Henry Mann, Inc.: *See*—
Furuya, Harumi, 4,573,501, Cl. 140-147.000.
Hercules Incorporated: *See*—
Shackelford, John R., 4,574,086, Cl. 426-62.000.
Herder, John C.; and Guay, Randall G., to Datapoint Corporation. Dual mode servo. 4,574,227, Cl. 318-594.000.
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Anders, Dietmar, 4,573,799, Cl. 366-89.000.
Hernandez, Paul C. Hedge trimmer. 4,573,269, Cl. 30-240.000.
Herrnring, Gunther, to Montblanc-Simplo GmbH. System for supplying ink for writing instruments. 4,573,819, Cl. 401-151.000.
Hesch, Harold E.; and McNally, George S., to Pullman Standard. Hitch mounting means. 4,573,843, Cl. 410-58.000.
Hess, Robert M.; and Jarrett, Robert B., to Motorola, Inc. Ignition control integrated circuit having substrate injection preventing means. 4,574,221, Cl. 315-209.00T.
Hess, Stanley R., to Cordis Corporation. Cardiac mapping probe. 4,573,473, Cl. 128-642.000.
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Highley, Robert W.; and Stanczak, Stephen J. Warp-resistant self-sealing coke oven door. 4,574,035, Cl. 202-242.000.
Hill, Arthur T., to Warner-Lambert Technologies, Inc. Microscope adjustment apparatus. 4,573,771, Cl. 350-521.000.
Hill, Clinton W., to U.S. Plastics Corp. Lamp assembly. 4,573,754, Cl. 339-60.00M.
Hill, William D.; Mercanti, William A., Jr.; Apple, Christian K.; and Loomis, Gary S., to General Electric Company. Universal logic card. 4,574,068, Cl. 376-259.000.
Hillyard, Colin D., to Pirelli General plc. Applying an elastic sleeve over an elongate body. 4,573,251, Cl. 29-450.000.
Hirai, Tatsuro: *See*—
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Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Hermetically sealed motor compressor. 4,573,880, Cl. 417-312.000.
Hirano, Yutaka: *See*—
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Hirasuna, Alan R.; and Veal, Gordon R., to L'Garde, Inc. Casing packer. 4,573,537, Cl. 166-387.000.
Hirohashi, Kazutoshi; and Ishigaki, Yukinobu, to Victor Company of Japan, Limited. Noise reduction for stereophonic FM signals by high-speed sampling and linear interpolation. 4,574,390, Cl. 381-13.000.
Hirose, Takao: *See*—
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Hirsch, Hermann. Strap with connecting part. 4,573,221, Cl. 2-338.000.
Hirschberg, Jakub, to Siemens Aktiengesellschaft. Implantable electrode lead with microporous insulation. 4,573,480, Cl. 128-784.000.
Hitachi, Ltd.: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Murata, Toshinori; Kazumi, Masafumi; and Ito, Yuji, 4,574,384, Cl. 377-58.000.
Sato, Tetsuo, 4,574,276, Cl. 340-661.000.
Simada, Tamotu; Shimbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,573,466, Cl. 128-303.100.
Tabata, Kuniaki; Tsuhara, Susumu; Machida, Tetsuo; Iwami, Hidefumi; and Okada, Yasuyuki, 4,574,364, Cl. 364-900.000.
Hitachi Maxell, Ltd.: *See*—
Kato, Yoshitake; and Naoi, Mitsuaki, 4,573,572, Cl. 206-303.000.
Hitachi Zosen Corporation: *See*—
Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, 4,573,422, Cl. 114-65.00R.
Hoag, Robert E.; and Mnich, Axel, to Instafil, Inc. Fluid transfer apparatus. 4,573,993, Cl. 604-411.000.
Hoberman, Barry A.; and Moss, William E., to Monolithic Memories, Inc. Memory cell and array. 4,574,367, Cl. 365-179.000.
Hoch, John J.; and Stricker, David K., to Deere & Company. Cooling air duct and screen arrangement for an air cooled engine. 4,573,544, Cl. 180-68.100.
Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., to U.S. Philips Corporation. Cathode-ray tube and semiconductor device for use in such a cathode-ray tube. 4,574,216, Cl. 313-444.000.
Hoechst Aktiengesellschaft: *See*—
Seuring, Bernhard; Lang, Hans-Jochen; Hropot, Max; and Muschaweck, Roman, 4,574,128, Cl. 514-469.000.
Hoeren, Gerd H.: *See*—
Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., 4,574,354, Cl. 364-481.000.
Hoesch Aktiengesellschaft: *See*—
Andree, Dietrich; and Creutz, Walter, 4,573,811, Cl. 384-622.000.
Hofer, Otto J., to Interrondo AG. Apparatus for producing a corrugated sheet. 4,574,028, Cl. 156-462.000.
Hoffman, Gregory A. Spinal fixation apparatus. 4,573,454, Cl. 128-69.000.
Hofmann, Karl-Heinz, to Braas & Co. GmbH. Ridge or hip covering for tiled roofs. 4,573,291, Cl. 52-43.000.
Hokushin Kogyo Kabushiki Kaisha: *See*—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Holcomb, David A.; and Tryon, James A., to Fite, F. Bartow. Combination condiment grinder and dispenser. 4,573,244, Cl. 241-169.000.
Holden, John; Colombrito, Sam; and Jeffreys, Arthur H., to Buddy L Corp. Steerable toy vehicle. 4,573,941, Cl. 446-451.000.
Holland, John M., to Cybermation, Inc. Mobile base for robots and the like. 4,573,548, Cl. 180-211.000.
Hollenberg, Jane: *See*—
Tietjen, Marlene; Hollenberg, Jane; and Rigg, Richard T., 4,574,082, Cl. 424-63.000.
Holling, George H.: *See*—
Pershall, Arthur A.; and Holling, George H., 4,574,225, Cl. 318-254.000.
Hollming Ltd.: *See*—
Savikurki, Jarmo; and Jansson, Kim, 4,573,929, Cl. 440-54.000.
Holmes, James C.: *See*—
Edwards, Neil A.; Holmes, James C.; and Wales, Denis I., 4,574,023, Cl. 156-187.000.
Holmes, Mark: *See*—
Moran, James P., Jr.; and Holmes, Mark, 4,574,138, Cl. 524-786.000.
Holsztynski, Wlodzimierz; and Wilson, Stephen S., to Environmental Research Institute of MI. Pipeline processor. 4,574,394, Cl. 382-41.000.
Holt, Dawn E.: *See*—
Coats, Montgomery R.; and Holt, Dawn E., 4,574,194, Cl. 250-308.000.
Holton, Raymond G. C., to Boeing Company, The. Lightning protection electrical circuit path for coupling between aircraft structures. 4,574,325, Cl. 361-218.000.
Homa, Arthur S.: *See*—
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.
Homann, Walter K., to Chemische Werke Huels, AG. Process for preparing anhydrous cyclic imido esters. 4,574,157, Cl. 548-239.000.
Homes, Graham D., to Lucas Industries Public Limited Company. Fluid control valve. 4,573,659, Cl. 251-129.020.
Honda Giken Kogyo K.K.: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,574,192, Cl. 250-227.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.
Inomata, Fumio; and Wakusaka, Kazuharu, 4,573,550, Cl. 180-296.000.
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,573,546, Cl. 180-89.100.
Shimizu, Yasuo; and Ogura, Masami, 4,573,373, Cl. 74-468.000.
Takahashi, Hirotake; and Nishikawa, Kenji, 4,573,698, Cl. 280-279.000.
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.

Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, to Citizen Watch Company Limited. Automatic assembling machine. 4,573,261, Cl. 29-701.000.

Honeycutt, Travis W., to Isopedix Corporation. Reinforced thixotropic gel composition. 4,574,097, Cl. 428-36.000.

Honeywell Inc.: *See*—
Benson, Florence; and Shireman, Mark J., 4,573,430, Cl. 118-411.000.
Singh, Donald R., 4,574,256, Cl. 331-107.0SL.

Hooten, Howard G. Necktie knot simulator. 4,573,219, Cl. 2-152.00R.

Hoppe, Eugene A.: *See*—
Dellinger, Thomas B.; Hoppe, Eugene A.; and Jones, Charles E., 4,573,540, Cl. 175-61.000.

Horikoshi, Tunenobu: *See*—
Hamazawa, Yoshikazu; Hirai, Tatsuro; Horikoshi, Tunenobu; and Ishida, Tomio, 4,574,262, Cl. 336-192.000.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,573,891, Cl. 418-173.000.

Horiuchi, Hideyuki: *See*—
Simada, Tamotu; Shimbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,573,466, Cl. 128-303.100.

Horn, Hans. Linear drive. 4,573,369, Cl. 74-110.000.

Horst, Robert W.: *See*—
Harris, Richard L.; and Horst, Robert W., 4,574,344, Cl. 364-200.000.

Horvatis, James F.: *See*—
Malachowski, Jerome A.; and Horvatis, James F., 4,573,555, Cl. 188-52.000.

Horwitz, E. Philip; and Kalina, Dale G., to United States of America, Energy. Method for extracting lanthanides and actinides from acid solutions by modification of purex solvent. 4,574,072, Cl. 423-9.000.

Hoshino, Chojiro. Toy music box. 4,573,939, Cl. 446-298.000.

Hosomizu, Hiroshi: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,573,786, Cl. 354-416.000.

Hosoo, Tomohiro: *See*—
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, 4,573,817, Cl. 401-65.000.

Houdek, Merle E.: *See*—
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.

Houle, Frances A.: *See*—
Baum, Thomas H.; Houle, Frances A.; Jones, Carol R.; and Kovac, Caroline A., 4,574,095, Cl. 427-53.100.

House, Richard F.: *See*—
Kohler, Karl A.; and House, Richard F., 4,573,634, Cl. 229-38.000.

Howell, Cecil A.; and Lacy, Ernest R., to Westinghouse Electric Corp. Nuclear fuel rod channel tray loading system. 4,573,847, Cl. 414-63.000.

Howes, Peter, to Lucas Industries Public Limited Company. Fuel injection pumping apparatus. 4,573,444, Cl. 123-502.000.

Hoy, David J. Knee orthotic hinge joint. 4,573,455, Cl. 128-80.00C.

HPS Corporation: *See*—
Peacock, Roy N., 4,573,717, Cl. 285-365.000.

Hropot, Max: *See*—
Seuring, Bernhard; Lang, Hans-Jochen; Hropot, Max; and Muschaweck, Roman, 4,574,128, Cl. 514-469.000.

Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., to General Electric Company. Multiple-impingement cooled structure. 4,573,865, Cl. 415-115.000.

Huber, Paul G.: *See*—
Beatty, Robert M.; Miller, Edward B.; and Huber, Paul G., 4,574,355, Cl. 364-492.000.

Huchital, Gerald S.: *See*—
Clark, Brian; and Huchital, Gerald S., 4,574,242, Cl. 324-338.000.

Huddleston, Robert J.: *See*—
Cobbs, Walter H., Jr.; Huddleston, Robert J.; and Guldner, Robert A., 4,574,005, Cl. 55-48.000.

Huffman, Charles E.; and Foust, Jeffrey L., to Rockwell International Corporation. Clock divider circuit incorporating a J-K flip-flop as the count logic decoding means in the feedback loop. 4,574,385, Cl. 377-107.000.

Huffman, Dawn M., to Kimberly-Clark Corporation. Outer tampon tube with recessed finger grip. 4,573,964, Cl. 604-15.000.

Hughes Aircraft Company: *See*—
Kliever, Waldo W., 4,574,197, Cl. 250-334.000.

Hughes Helicopters, Inc.: *See*—
Yao, Samuel S.; and Chu, Samuel K. F., 4,573,873, Cl. 416-114.000.

Huiber, Otto A., to Hi-Tech Engineering, Inc. Valve leak detector. 4,573,343, Cl. 73-40.000.

Hukuba Kogyo Kabushiki Kaisha: *See*—
Saeki, Kimihiro; and Kobayashi, Kiyoshi, 4,573,230, Cl. 15-41.00R.

Hulett, Richard H.: *See*—
Midgley, John A.; and Hulett, Richard H., 4,574,188, Cl. 219-549.000.

Hulseweh, Terry S., to Motorola, Inc. Method of forming self-aligned implanted channel-stop and buried layer utilizing non-single crystal alignment key. 4,573,257, Cl. 29-576.00E.

Hultz, Robert C.: *See*—
Stamper, Richard W.; and Hultz, Robert C., 4,574,103, Cl. 428-213.000.

Hulyer, Michael G., to U.S. Philips Corporation. High-definition color television transmission system. 4,574,300, Cl. 358-11.000.

Huneke, James T.: *See*—
Dorey, John K., II; Huneke, James T.; Madsen, Bruce S.; and Schaaf, Theodore F., 4,574,031, Cl. 156-655.000.

Hunter, Stephen K. Artificial fallopian tube. 4,574,000, Cl. 623-12.000.

Huntington Institute of Applied Research: *See*—
Bullara, Leo A., 4,573,481, Cl. 128-784.000.

Huperz, Adalbert: *See*—
Maasberg, Wolfgang; and Huperz, Adalbert, 4,573,886, Cl. 417-454.000.

Hurley, Byron H.; and Ricks, Walter G., to Hurley, Byron H. Container filling apparatus and method. 4,573,502, Cl. 141-1.000.

Hurner, Erwin E. Golf tee dispenser. 4,573,610, Cl. 221-281.000.

Hurtig, Mats E.; and Karlsson, Gosta K. Apparatus for measuring wind-speed and/or direction. 4,573,352, Cl. 73-189.000.

Husted, Rodney O., to Anchor/Darling Valve Company. Double disc gate valve. 4,573,660, Cl. 251-195.000.

Huth, Brian P.: *See*—
Sandy, James J., Jr.; and Huth, Brian P., 4,573,866, Cl. 415-116.000.

Hyatt, Douglas K.: *See*—
Hyatt, James R.; and Hyatt, Douglas K., 4,573,381, Cl. 82-36.00R.

Hyatt, James R.; and Hyatt, Douglas K., to Top Tech, Inc. Boring device. 4,573,381, Cl. 82-36.00R.

Hyde, Kirk R., to Kirkplastic Company Incorporated. Secure credit card and method of manufacturing same. 4,573,711, Cl. 283-98.000.

Hydro-Plan Engineering Ltd.: *See*—
Mehoudar, Raphael, 4,573,640, Cl. 239-542.000.

Ichikawa, Takeo: *See*—
Sekiguchi, Akira; Ichikawa, Takeo; Inoue, Kazuo; Fujimori, Kyoichi; Hirano, Yutaka; and Yasuhara, Seishi, 4,573,347, Cl. 73-119.00A.

Ichikoh Industries, Ltd.: *See*—
Igura, Kenkichi, 4,574,334, Cl. 362-66.000.

Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, to Chichibu Cement Kabushiki Kaisha; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method and apparatus for producing white cement clinker. 4,573,908, Cl. 432-58.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Aishima, Takanori; Utsumi, Makoto; and Ezaki, Yoshihiro, 4,574,104, Cl. 428-220.000.

Idesign, Inc.: *See*—
Ma, Hansan, 4,573,332, Cl. 70-30.000.

Idex (Jersey) Limited: *See*—
Frampton, Jeffery A.; and Bartman, Nicholas, 4,573,735, Cl. 296-218.000.

Igura, Kenkichi, to Ichikoh Industries, Ltd. Device for adjusting the inclination of the light axis of headlamps of a motor vehicle. 4,574,334, Cl. 362-66.000.

Iikura, Shoichi, to Kabushiki Kaisha Toshiba. Robot hand. 4,573,727, Cl. 294-115.000.

Ikeda, Tadashi: *See*—
Adachi, Keiichi; Ikeda, Tadashi; and Tani, Tadaaki, 4,574,115, Cl. 430-522.000.

Illinois Bell Telephone Company: *See*—
Armbruster, George E., 4,573,715, Cl. 285-94.000.

Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, to Hitachi, Ltd.; Sumitomo Metal Industries, Ltd.; and Nippon Mining Co., Ltd. Method of production of cladding tube for nuclear fuel element. 4,573,629, Cl. 228-173.200.

Imperial Chemical Industries PLC: *See*—
Edwards, Philip N.; and Large, Michael S., 4,574,123, Cl. 514-210.000.

Implant Technologies: *See*—
Szachowicz, Edward H.; and Walsh, John, 4,573,460, Cl. 128-200.260.

INA Walzlager Schaeffler KG: *See*—
Frank, Hubertus; and Gebauer, Rainer, 4,573,692, Cl. 277-152.000.
Jacob, Werner, 4,573,809, Cl. 384-493.000.

Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for dividing the elements of a Galois field. 4,574,361, Cl. 364-761.000.

Inatomi, Takao, to Kabushiki Kaisha Komatsu Seisakusho. Contactless press control device. 4,574,343, Cl. 364-184.000.

Inbar, Michael, to Applied Magnetics Corporation. System for measuring selected parameters of electrical signals and method. 4,574,234, Cl. 324-73.00R.

Industrie Pirelli S.p.A.: *See*—
Tangorra, Giorgio, 4,573,953, Cl. 474-152.000.

Industrietechnik Kalenborn GmbH: *See*—
Stocksiefen, Peter; and Gruber, Alfons, 4,573,231, Cl. 15-104.06R.

Ing. C. Olivetti & C. S.p.A.: *See*—
Berruti, Pierangelo; and Cella, Giancarlo, 4,573,814, Cl. 400-568.000.
Ing. Loro Piana & C. S.p.A.: *See*—
Prandina, Aldo F., 4,573,227, Cl. 5-486.000.
Innovative Surgical Products, Inc.: *See*—
Blake, Larry W., 4,573,979, Cl. 604-240.000.
Inokuma, Toshio: *See*—
Asada, Eiichi; Inokuma, Toshio; and Yamazoe, Mikio, 4,574,055, Cl. 252-514.000.
Inomata, Fumio; and Wakusaka, Kazuharu, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust pipe apparatus for vehicle. 4,573,550, Cl. 180-296.000.
Inoue, Kazuo: *See*—
Sekiguchi, Akira; Ichikawa, Takeo; Inoue, Kazuo; Fujimori, Kyoichi; Hirano, Yutaka; and Yasuhara, Seishi, 4,573,347, Cl. 73-119.00A.
Inoue, Yasuo: *See*—
Endo, Itaru; and Inoue, Yasuo, 4,573,772, Cl. 350-526.000.
Instafil, Inc.: *See*—
Hoag, Robert E.; and Mnich, Axel, 4,573,993, Cl. 604-411.000.
Institut National Polytechnique de Grenoble: *See*—
Cantin, Michel; Jaussaud, Pierre; and Olivella, Roger, 4,573,414, Cl. 104-202.000.
Insulated Chimneys (Trim) Limited: *See*—
Foy, Martin, 4,573,400, Cl. 98-60.000.
Intel Corporation: *See*—
Senderowicz, Daniel, 4,574,250, Cl. 330-258.000.
Interblock Partners, Ltd.: *See*—
Heilman, Nikolaus J.; Wix, David A.; and Egerer, Gary M., 4,573,902, Cl. 425-543.000.
International Business Machines Corporation: *See*—
Baum, Thomas H.; Houle, Frances A.; Jones, Carol R.; and Kovac, Caroline A., 4,574,095, Cl. 427-53.100.
Blue, Larry A.; and Conner, David E., 4,574,228, Cl. 318-696.000.
Bonnet, Yves A., 4,574,204, Cl. 307-273.000.
Carlgren, Richard G.; Reed, Martin A.; and Rosenbaum, Walter S., 4,574,363, Cl. 364-900.000.
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.
Deighton, Guy A.; and Moore, Gerry W., 4,573,779, Cl. 354-4.000.
Hartung, Michael H., 4,574,346, Cl. 364-200.000.
Ko, Michael A., 4,574,382, Cl. 375-25.000.
Lechaton, John S.; Pitner, Philip M.; and Srinivasan, Gurumakonda R., 4,573,256, Cl. 29-576.00B.
Rechtschaffen, Rudolph N., 4,574,349, Cl. 364-200.000.
Richardson, Raymond H.; and Valley, Robert T., 4,573,830, Cl. 406-84.000.
Scheuerlein, Roy E., 4,574,365, Cl. 365-149.000.
International Harvester Company: *See*—
Slindee, Edward A., 4,573,349, Cl. 73-119.00A.
International Paper Company: *See*—
Murdick, Brian K.; and Haase, William H., 4,573,579, Cl. 206-525.000.
International Shoe Machine Corporation: *See*—
Moreira, Anthony F., 4,573,229, Cl. 12-8.100.
International Standard Electric Corporation: *See*—
Auch, Wilfried; Mohr, Friedemann; Schlemper, Eberhard; and Steudle, Walter, 4,573,795, Cl. 356-350.000.
Cleemput, Camiel D. E.; and Coussement, Hedwig L. Z., 4,573,406, Cl. 101-127.100.
Crossland, William A.; Peters, Jack R.; Ross, Peter W.; and Ayliffe, Peter J., 4,574,282, Cl. 340-784.000.
Interrondo AG: *See*—
Hofer, Otto J., 4,574,028, Cl. 156-462.000.
Inui, Toshiharu; and Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Compensation for heat accumulation in a thermal head. 4,574,293, Cl. 364-76.0PH.
Inventio AG: *See*—
Schlegel, Urs; Tomse, Ljudevit; and Wenger, Urs, 4,573,542, Cl. 177-132.000.
Io, Shinichi; and Saeki, Funio, to Atsugi Motor Parts Co., Ltd. Method of manufacturing motor. 4,573,258, Cl. 29-596.000.
Ipema, Neal J.; and Portz, William E., to True Temper Corporation. Lawn rake. 4,573,311, Cl. 56-400.170.
Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Tire for heavy loads. 4,573,510, Cl. 152-159.000.
Ireland, Clive L. M., to J. K. Lasers Limited. Dispersive prism arrangement. 4,573,765, Cl. 350-286.000.
Irie, Kazunari; Taka, Masahiro; and Murakami, Hideyo, to Nippon Telegraph & Telephone Public Corporation. Decoder of adaptive differential pulse code modulation. 4,574,383, Cl. 375-27.000.
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, to Honda Giken Kogyo Kabushiki Kaisha. Three-wheeled motor vehicle. 4,573,546, Cl. 180-89.100.
Ishiai, Yoshio: *See*—
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Ishida, Tomio: *See*—
Hamazawa, Yoshikazu; Hirai, Tatsuro; Horikoshi, Tunenobu; and Ishida, Tomio, 4,574,262, Cl. 336-192.000.
Ishigaki, Yukinobu: *See*—
Hirohashi, Kazutoshi; and Ishigaki, Yukinobu, 4,574,390, Cl. 381-13.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.
Ishizaka, Hideo; and Hanzawa, Yoshiki, to Terumo Kabushiki Kaisha. Electronic clinical thermometer, and method of measuring body temperature. 4,574,359, Cl. 364-557.000.
Ishizuka, Akio: *See*—
Arakawa, Satoshi; Matsuda, Terumi; Ishizuka, Akio; and Shibahara, Yoshihiko, 4,574,102, Cl. 428-212.000.
Iskra, Michael J.: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,573,988, Cl. 604-379.000.
Isopedix Corporation: *See*—
Honeycutt, Travis W., 4,574,097, Cl. 428-36.000.
Ito, Hiroshisa: *See*—
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.
Ito, Katsumi: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,573,547, Cl. 180-168.000.
Ito, Yoshihiro. Autogenic training and treating apparatus. 4,573,472, Cl. 128-399.000.
Ito, Yuji: *See*—
Murata, Toshinori; Kazumi, Masafumi; and Ito, Yuji, 4,574,384, Cl. 377-58.000.
Itoh, Yoshikazu: *See*—
Watanabe, Fumio; and Itoh, Yoshikazu, 4,574,304, Cl. 358-84.000.
ITT Corporation: *See*—
Albritton, Charles W.; Powis, William N.; and Graham, William M., 4,573,912, Cl. 432-222.000.
Heesch, Max O., 4,573,738, Cl. 297-362.000.
IVAC Corporation: *See*—
Parker, Kenneth B., 4,573,968, Cl. 604-67.000.
Iwabori, Tomio: *See*—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Iwahashi, Ituo: *See*—
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Iwami, Hidefumi: *See*—
Tabata, Kuniaki; Tsuhara, Susumu; Machida, Tetsuo; Iwami, Hidefumi; and Okada, Yasuyuki, 4,574,364, Cl. 364-900.000.
J. K. Lasers Limited: *See*—
Ireland, Clive L. M., 4,573,765, Cl. 350-286.000.
Jacks, Thomas M.: *See*—
Fisher, Michael H.; and Jacks, Thomas M., 4,574,125, Cl. 514-284.000.
Jacob, Keith, to Multi-Elmac Company. FM Signal demodulator. 4,574,247, Cl. 329-126.000.
Jacob, Werner, to INA Walzlager Schaeffler KG. Shaft mounting. 4,573,809, Cl. 384-493.000.
Jacobson, Chester F., to Gillette Company, The. Razor blade assembly. 4,573,266, Cl. 30-41.000.
Jacobsson, Kurt A. G.: *See*—
Hellstrom, Jerker; Tholander, Lars H. G.; and Jacobsson, Kurt A. G., 4,574,353, Cl. 364-470.000.
Jacquett, Harold W.: *See*—
Musto, Joseph A.; Scarella, Robert A.; Jacquett, Harold W.; Riolo, Angelo V.; and Della Fave, Nicholas I., 4,574,089, Cl. 426-386.000.
Jailor, John J.: *See*—
Baird, Thomas E., Sr.; and Jailor, John J., 4,573,235, Cl. 15-328.000.
Jansen, Martin B.: *See*—
Pomonik, George M.; and Jansen, Martin B., 4,573,425, Cl. 114-230.000.
Jansson, Kim: *See*—
Savikurki, Jarmo; and Jansson, Kim, 4,573,929, Cl. 440-54.000.
Janszen, Jeffrey G. Water powered batting device. 4,573,679, Cl. 273-26.00E.
Jaraczewski, Kathleen A.: *See*—
Arrington, John P.; Jaraczewski, Kathleen A.; Moisson, Marc F.; and Wisecarver, Martin L., 4,573,607, Cl. 221-25.000.
Jarrett, Robert B.: *See*—
Hess, Robert M.; and Jarrett, Robert B., 4,574,221, Cl. 315-209.00T.
Jason, Barry L., to Motorola, Inc. Logarithmic digitally variable gain controlled amplifier. 4,574,251, Cl. 330-279.000.
Jasper Corporation, The: *See*—
Frobose, James W., 4,573,740, Cl. 297-452.000.
Jaussaud, Pierre: *See*—
Cantin, Michel; Jaussaud, Pierre; and Olivella, Roger, 4,573,414, Cl. 104-202.000.
Jeffreys, Arthur H.: *See*—
Holden, John; Colombrito, Sam; and Jeffreys, Arthur H., 4,573,941, Cl. 446-451.000.
Jenner, Frank H.: *See*—
Smith, John L.; and Jenner, Frank H., 4,573,756, Cl. 339-117.00P.
Jeschke, Willi, to Heidelberger Druckmaschinen AG. Inking mechanism for offset printing machines. 4,573,407, Cl. 101-148.000.
Jett, James H.: *See*—
Martin, John C.; and Jett, James H., 4,573,796, Cl. 356-318.000.
Jewell, Jack L., to United States of America, Air Force. Optical flip-flop system. 4,573,767, Cl. 350-354.000.

Jewett, Gary L.: *See—*
McLachlan, Richard D.; Jewett, Gary L.; and Evans, John C., 4,573,761, Cl. 350-96.240.
John Zink Company: *See—*
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,573,906, Cl. 431-202.000.
Johns Hopkins University, The: *See—*
Fischell, Robert E.; and Lord, Peter C., 4,573,994, Cl. 604-891.000.
Potember, Richard S.; Poehler, Theodore O.; and Benson, Richard C., 4,574,366, Cl. 365-153.000.
Johnson, Carl N.; Phadke, Hemant; and Sieling, Roger L., to Ranco Incorporated. Pressure control device and method of making the same. 4,573,398, Cl. 92-101.000.
Johnson, Carl W.; and Kotschi, Stanley W., to H. B. Fuller Company. Apparatus and method for transferring and applying material. 4,574,022, Cl. 156-164.000.
Johnson, Harold K., to Mid America Machine Corp. Slitter assembly for double fold bottomer apparatus. 4,573,956, Cl. 493-237.000.
Johnson, James R.: *See—*
Daniel, Vernon T.; Johnson, James R.; and Robbins, Edward J., 4,573,353, Cl. 73-198.000.
Johnson, Stanley J.; and Gold, Gary L., to Deere & Company. Spout aimer with feed roll rotation sensing. 4,573,849, Cl. 414-334.000.
Johnson, Thomas E., to Timberjack Inc. Snubbing apparatus for grapples and the like. 4,573,728, Cl. 294-119.400.
Johnson, Thomas M.: *See—*
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., 4,573,842, Cl. 410-23.000.
Joint Lock Corporation, The: *See—*
Orchard, Melvin C.; and Rogers, Michael, 4,573,721, Cl. 292-145.000.
Jokel, Isidore. Window intrusion barrier. 4,573,285, Cl. 49-55.000.
Jonergin, Inc.: *See—*
Kwiatek, Alfred; and Schwartz, Jack W., 4,573,996, Cl. 604-897.000.
Jones, Bruce D.: *See—*
Starling, Jeffrey T.; and Jones, Bruce D., 4,573,603, Cl. 220-5.00R.
Jones, Carol R.: *See—*
Baum, Thomas H.; Houle, Frances A.; Jones, Carol R.; and Kovac, Caroline A., 4,574,095, Cl. 427-53.100.
Jones, Charles E.: *See—*
Dellinger, Thomas B.; Hoppe, Eugene A.; and Jones, Charles E., 4,573,540, Cl. 175-61.000.
Jones, Donald A.; Wawra, Gerhard F.; and Moss, William R., to Baker Perkins, Pty., Ltd. Positive pressure dough divider. 4,573,898, Cl. 425-145.000.
Jones, Eugene R.: *See—*
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.
Jones, Frank W. Dicing device for sliced food articles. 4,573,384, Cl. 83-404.300.
Jones, Michael D.; and Longford, James B., to Dowty Mining Equipment Limited. Roof support suitable for use in mines. 4,573,828, Cl. 405-293.000.
Jones, Stanley C., to Marathon Oil Company. Apparatus and method for the automatic porosity and permeability testing of multiple core samples. 4,573,342, Cl. 73-38.000.
Jones, Trevor O., to TRW Inc. Tire pressure warning system. 4,574,267, Cl. 340-58.000.
Joormann, Hendrik J. M.; and Spierings, Gijsbertus A. C. M., to U.S. Philips Corporation. Germanium-free optical fibers having large numerical apertures. 4,573,762, Cl. 350-96.340.
Jos. Hunkeler Ltd.: *See—*
Felix, Willi, 4,573,670, Cl. 270-39.000.
Josse, Jean-Jacques; Pujols, Guy; and Di Vincenzo, Serge, to Societe Nationale Elf Aquitaine. Multi-drain drilling and petroleum production start-up device. 4,573,541, Cl. 175-78.000.
Jost, Ernest M.: *See—*
Conaway, Donald E., Jr.; and Jost, Ernest M., 4,573,265, Cl. 29-879.000.
Jovanovic, Milenko, to Bayerische Motoren Werke Aktiengesellschaft. Resistance welding apparatus. 4,574,175, Cl. 219-86.100.
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., to Satellite Industries, Inc. Method of forming an end panel for a building and door unit. 4,574,025, Cl. 156-245.000.
Jung, Ingvar K. E., to Westinghouse Electric Corp. Steam generator flow control device. 4,573,526, Cl. 165-134.100.
Junkers, Gerd, to Wahlco, Inc. Injection probe. 4,573,638, Cl. 239-397.500.
K-Line Industries, Inc.: *See—*
Kammerand, James A., 4,573,340, Cl. 72-479.000.
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, to Bayer Aktiengesellschaft. Lipid absorption-inhibiting agents and their use. 4,574,124, Cl. 514-228.000.
Kabe, Kazuyuki; and Morikawa, Tuneo, to Yokohama Rubber Co., Ltd., The. Pneumatic tire. 4,573,511, Cl. 152-548.000.
Kabushiki Kaisha Daikin Seisakusho: *See—*
Kajitani, Kouji; and Fukushima, Hirotaka, 4,573,945, Cl. 464-68.000.
Koshimo, Masahiko; and Murakami, Kiyoharu, 4,573,374, Cl. 74-574.000.
Kabushiki Kaisha Honda Rokku: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,574,192, Cl. 250-227.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Saito, Tsutomu, 4,573,390, Cl. 84-115.000.
Kabushiki Kaisha Kawakami Seisakusho: *See—*
Nasu, Nobuo, 4,573,834, Cl. 408-16.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Amano, Itaru; Maikuma, Yoshimata; Ozaki, Keiji; and Ohnishi, Hisaaki, 4,573,859, Cl. 414-628.000.
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, 4,573,515, Cl. 164-468.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Inatomi, Takao, 4,574,343, Cl. 364-184.000.
Kajiyama, Koichi; Moro, Norio; Sajiki, Kazuaki; and Yamaguchi, Tadayoshi, 4,573,792, Cl. 356-301.000.
Kabushiki Kaisha Matsuura Kikai Seisakusho: *See—*
Kondo, Koji, 4,573,833, Cl. 408-3.000.
Kabushiki Kaisha Meidensha: *See—*
Sueoka, Tetsuro; and Kubo, Takeharu, 4,574,296, Cl. 357-38.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Momose, Masao, 4,574,323, Cl. 360-99.000.
Kabushiki Kaisha Toshiba: *See—*
Iikura, Shoichi, 4,573,727, Cl. 294-115.000.
Sanbayashi, Takeshi; and Oushiden, Hideshi, 4,573,787, Cl. 355-14.00E.
Takikawa, Osamu; and Harata, Mitsuo, 4,574,292, Cl. 346-76.0PH.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Ohno, Makoto; Kobayashi, Hisao; and Kato, Kimio, 4,573,878, Cl. 417-270.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Takahashi, Hideaki; Kondo, Haruyoshi; Takeuchi, Takashi; Hayakawa, Kiyoharu; and Muraki, Hideaki, 4,574,264, Cl. 338-34.000.
Kabushiki Kaisha Universal: *See—*
Okada, Kazuo, 4,573,681, Cl. 273-143.00R.
Kaiser, Gunther; and Nitschke, Werner, to Robert Bosch GmbH. System for monitoring the sensor responsive to a periodic condition in an internal combustion engine. 4,574,265, Cl. 340-52.00R.
Kaiser, Hans-Georg: *See—*
Lindemann, Bernd; Landwehr, Gotz; and Kaiser, Hans-Georg, 4,573,386, Cl. 83-833.000.
Kajitani, Kouji; and Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Damper disc of a long travel type. 4,573,945, Cl. 464-68.000.
Kajiyama, Koichi; Moro, Norio; Sajiki, Kazuaki; and Yamaguchi, Tadayoshi, to Kabushiki Kaisha Komatsu Seisakusho. Method of and apparatus for quantitative analysis in accordance with CARS. 4,573,792, Cl. 356-301.000.
Kaletsky, Robert B. Apparatus for the automatic purging of the reservoir in a water recirculation system. 4,573,490, Cl. 137-124.000.
Kalina, Dale G.: *See—*
Horwitz, E. Philip; and Kalina, Dale G., 4,574,072, Cl. 423-9.000.
Kalns, Ilmars, to Eaton Corporation. Fail-safe device for an electrical power assisted steering system including an in-line clutch mechanism. 4,573,545, Cl. 180-79.100.
Kaltenbach & Voight GmbH & Co.: *See—*
Bareth, Erich, 4,573,918, Cl. 433-127.000.
Kambin, Parviz, to Pilling Co. Method for decompressing herniated intervertebral discs. 4,573,448, Cl. 128-1.00R.
Kamioka, Hiroshi: *See—*
Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, 4,573,261, Cl. 29-701.000.
Kammeraad, James A., to K-Line Industries, Inc. Valve guide liner broaching tool. 4,573,340, Cl. 72-479.000.
Kamo, Hisao: *See—*
Yamagishi, Haruo; and Kamo, Hisao, 4,574,298, Cl. 357-71.000.
Kampf, Richard S., to Beckman Instruments, Inc. Coil spring conveyor for positioning an external radioactive standard in a liquid scintillation counter. 4,574,196, Cl. 250-328.000.
Kamstra, Paulus R., to Duphar International Research B.V. Automatic injection device. 4,573,971, Cl. 604-191.000.
Kamstra, Paulus R., to Duphar International Research B.V. Automatic injection device. 4,573,972, Cl. 604-191.000.
Kan, C. Eric: *See—*
Sharma, Rajeeva; and Kan, C. Eric, 4,573,402, Cl. 100-38.000.
Kanai, Seita; and Kanazawa, Hirotaka, to Mazda Motor Corporation. Suspension and steering control of motor vehicles. 4,573,705, Cl. 280-708.000.
Kanayama, Katsumi, to Olympus Optical Company Limited. Automatic backspace device for a tape recorder. 4,574,321, Cl. 360-74.100.
Kanazawa, Hirotaka: *See—*
Kanai, Seita; and Kanazawa, Hirotaka, 4,573,705, Cl. 280-708.000.
Kaneda, Michihiro: *See—*
Sugiyama, Seiji; Suenaga, Norihiro; Suenaga, Nobuyuki; and Kaneda, Michihiro, 4,573,465, Cl. 128-303.100.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.
Kano, Toshiji: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.
Kaplan, Henry S.; Teng, Nelson N. H.; Lam, Kit S.; and Calvo-Riera, Francisco, to Leland Stanford Jr. University, The Board of Trustees of the. Methods and cell lines for immortalization and monoclonal antibody production by antigen-stimulated B-lymphocytes. 4,574,116, Cl. 435-68.000.

Kaplan, Isaac R.: *See*—
Demaison, Gerard J.; and Kaplan, Isaac R., 4,574,118, Cl. 436-29.000.
Kappertz, Fritz: *See*—
Bergrath, Siegmar; and Kappertz, Fritz, 4,573,575, Cl. 206-380.000.
Kapralov, Valery K.: *See*—
Garkusha, Ivan S.; Kazak, Vadim N.; and Kapralov, Valery K., 4,573,531, Cl. 166-259.000.
Karabin, Tadeusz: *See*—
Coppin, William P.; and Karabin, Tadeusz, 4,573,907, Cl. 431-351.000.
Karami, Hamzeh; and Delvaux, Myriam, to Colgate-Palmolive Company. Disposable diaper and method of manufacture. 4,573,989, Cl. 604-381.000.
Karlsson, Gosta K.: *See*—
Hurtig, Mats E.; and Karlsson, Gosta K., 4,573,352, Cl. 73-189.000.
Karrasch, Frank; and Love, John F., to Baxter Travenol Laboratories, Inc. Port protector. 4,573,980, Cl. 604-256.000.
Kartinos, Nicholas J.: *See*—
Dolkart, Ralph E.; and Kartinos, Nicholas J., 4,574,085, Cl. 424-148.000.
Kasai, Chihiro: *See*—
Namekawa, Koroku; Koyano, Akira; and Kasai, Chihiro, 4,573,477, Cl. 128-663.000.
Kasner, William H.; Miller, Richard A.; and Toth, Vincent A., to Westinghouse Electric Corp. Beam alignment system for laser welding system. 4,574,180, Cl. 219-121.0LY.
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., to U.S. Philips Corporation. Crystal resonator oscillator having circuitry for suppressing undesired crystal harmonics. 4,574,257, Cl. 331-116.00R.
Kasting, Edward W., to Cummins Engine Company, Inc. Oil pump arrangement for supplying oil under pressure in an internal combustion engine. 4,573,439, Cl. 123-195.00A.
Katayama, Kaoru, to Nissan Motor Co., Ltd. Pneumatic journal bearing. 4,573,808, Cl. 384-114.000.
Kato, Chiaki: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.
Kato, Hiroshi, to Fuji Xerox Co., Ltd. Picture image filing apparatus. 4,574,395, Cl. 382-61.000.
Kato, Itsuro: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.
Kato, Kiichi: *See*—
Takemura, Haruhiko; Kato, Kiichi; and Sakamoto, Masaharu, 4,574,371, Cl. 369-100.000.
Kato, Kimio: *See*—
Ohno, Makoto; Kobayashi, Hisao; and Kato, Kimio, 4,573,878, Cl. 417-270.000.
Kato, Masatake, to Canon Kabushiki Kaisha. Viewfinder having two image planes. 4,573,781, Cl. 354-201.000.
Kato, Tsutomu: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.
Kato, Yoshitake; and Naoi, Mitsuaki, to Hitachi Maxell, Ltd.; and Matsumi Electric Co. Recording disc cartridge. 4,573,572, Cl. 206-303.000.
Katou, Shinji: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; and Katou, Shinji, 4,573,519, Cl. 164-97.000.
Katsuya, Hiroo: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.
Katz, David, to Metalworking Lasers International Ltd. Apparatus for establishing and maintaining a stable discharge across a stream of flowing gas, particularly useful for high-power lasers. 4,574,381, Cl. 372-87.000.
Kaufman, Charles E.; Shetler, Marvin R.; and Sharp, William M., to Restroom Facilities Corporation. Prefabricated, self-contained building. 4,573,292, Cl. 52-79.100.
Kaufman, Lance R. Compact circuit package with improved construction for clamping to enhance heat transfer. 4,574,162, Cl. 174-16.0HS.
Kavoussi, James P.; and Hartford, Louise D. Scent-awake electronic clock. 4,573,804, Cl. 368-12.000.
Kawaguchi, Yozo: *See*—
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.
Kawahara, Akira: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Kawai, Osamu; Yamamoto, Kazuo; and Yokote, Yoshihiro, to NSK-Warner K.K. Latch device for a webbing anchor. 4,573,709, Cl. 280-804.000.
Kawai, Zenzaburo: *See*—
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.
Kawakami, Hirokazu: *See*—
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Kawasaki, Shozo: *See*—
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, 4,573,515, Cl. 164-468.000.
Kaza, Michael D.; and Sauers, Paul S., to Neville Chemical Company. Compositions for printing ink varnishes. 4,574,057, Cl. 260-101.000.
Kazak, Vadim N.: *See*—
Garkusha, Ivan S.; Kazak, Vadim N.; and Kapralov, Valery K., 4,573,531, Cl. 166-259.000.
Kazumi, Masafumi: *See*—
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KDI Sylvan Pools, Inc.: *See*—
van den Broek, William A., 4,574,048, Cl. 210-136.000.
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M. Plastic-pipe locator tool. 4,573,829, Cl. 405-157.000.
Keller, Michael R.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,573,906, Cl. 431-202.000.
Kelly, Thomas C.; Wurscher, Robert J.; Petrich, Dennis M.; and Rideout, Earl H., to Micro Component Technology, Inc. Transmission line connector and contact set assembly for test site. 4,574,235, Cl. 324-158.00F.
Kemp, Michael F.; and Champagne, Claude J., to Northern Telecom Limited. Interface arrangement for a telephone system or the like. 4,574,375, Cl. 370-67.000.
Kendall Company, The: *See*—
Annis, Larry D., 4,573,983, Cl. 604-322.000.
Kendall, Joyce M.: *See*—
Gupte, Anil J.; and Kendall, Joyce M., 4,574,052, Cl. 252-90.000.
Kennard, Reed H.; and Miller, Lewis R., to Vickers, Incorporated. Power transmission. 4,573,365, Cl. 74-15.800.
Kennard, Reed H., to Vickers, Incorporated. Power transmission. 4,573,366, Cl. 74-15.800.
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., to Buddy L Corporation. Motorized toy vehicle. 4,573,943, Cl. 446-463.000.
Kennel, Gordon H. Sled apparatus. 4,573,695, Cl. 280-20.000.
Kern, Hans: *See*—
Arens, Hans; Kern, Hans; and Haslberger, Richard, 4,573,491, Cl. 137-218.000.
Kerrigan, Jerome J.; and Domanowski, Gregory E., to F. J. Kerrigan Plumbing Co. Deicing method and apparatus. 4,573,802, Cl. 366-152.000.
Kervennal, Jacques; and Durual, Pierre, to ATOCHEM. Decane-1,10-diisocyanates and methods of making the same. 4,574,059, Cl. 560-347.000.
Kiamil, Sinan B.: *See*—
Potter, William D.; and Kiamil, Sinan B., 4,574,130, Cl. 523-111.000.
Kidd, Inc.: *See*—
Kimura, Shoichi, 4,574,056, Cl. 252-514.000.
Kienzle Apparate GmbH: *See*—
Adams, Jurgen; and Scholl, Hans-Peter, 4,574,189, Cl. 235-30.00R.
Kikuchi, Hidetomo, to N.C.A. Co., Ltd. Apparatus for unrolling and spreading rolled cloth. 4,573,618, Cl. 226-42.000.
Kikuchi, Yoshiki: *See*—
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,574,281, Cl. 340-783.000.
Kikukawa, Katsuyoshi: *See*—
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, 4,573,817, Cl. 401-65.000.
Kim, In S. Power efficient motor starter and circuit breaker for an induction motor. 4,574,229, Cl. 318-788.000.
Kimberly-Clark Corporation: *See*—
Endres, Dan D.; and Matray, Attila, 4,574,021, Cl. 156-152.000.
Huffman, Dawn M., 4,573,964, Cl. 604-15.000.
Kloehn, Kurt J.; Rajala, Gregory J.; and Abel, Kent W., 4,573,382, Cl. 83-53.000.
Sheldon, Donald A., 4,573,963, Cl. 604-15.000.
Kimberly-Clark Limited: *See*—
Maddison, David; and Dawson, Christopher, 4,573,612, Cl. 222-94.000.
Kimmich, Karl C., to Mobil Oil Corporation. Heater treater economizer system. 4,573,911, Cl. 432-179.000.
Kimura, Shoichi, to Kidd, Inc. Die-bonding electroconductive paste. 4,574,056, Cl. 252-514.000.
King, Martin J., to Extracorporeal Medical Specialties, Inc. Electronic control methods for puvapheresis apparatus. 4,573,961, Cl. 604-6.000.
Kinghorn, John R., to U.S. Philips Corporation. Dynamically operable two-phase logic circuits. 4,574,386, Cl. 377-121.000.
Kingo, Takao: *See*—
Goto, Shinji; Kingo, Takao; Ochi, Akira; and Yoshikawa, Yoshiro, 4,573,694, Cl. 280-5.00A.
Kingston, Leo: *See*—
Krauss, Timothy A.; and Kingston, Leo, 4,573,871, Cl. 416-20.00R.
Kinsman, Donald V.; and Luken, Clement H., Jr., to National Distillers and Chemical Corporation. Soap/syndet bars filled with fatty acid coated reactive filler. 4,574,053, Cl. 252-134.000.
Kipp, Robert M.; and Ayers, Ray R., to Shell Oil Company. Belle-lock grip device. 4,573,713, Cl. 285-319.000.
Kirchhoff, Kenneth J., to Minnesota Mining and Manufacturing Company. Applicator tip assembly for a pen-like instrument. 4,573,820, Cl. 401-214.000.
Kirchner-Carl, Angelika. Furniture structural component. 4,573,741, Cl. 297-452.000.
Kirk, Kenneth H.; and Tarbuck, Robert R., to Sperry Corporation. Apparatus for maintaining electronic component pin alignment. 4,573,254, Cl. 29-564.800.

Kirkplastic Company Incorporated: *See*—
Hyde, Kirk R., 4,573,711, Cl. 283-98.000.
Kishimoto, Yoshio: *See*—
Uemura, Seiichi; Hirose, Takao; Sohda, Yoshio; Sakamoto, Takayoshi; and Kishimoto, Yoshio, 4,574,077, Cl. 423-447.600.
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, to Honda Giken Kogyo K.K.; Kabushiki Kaisha Honda Rokku; and Kokoku Control Cable Kabushiki Kaisha. Flexible fiber optic tying member for theftproof device. 4,574,192, Cl. 250-227.000.
Kitahara, Harumi: *See*—
Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, 4,573,261, Cl. 29-701.000.
Kitamoto, Manabu, to Tokyo Shibaura Denki Kabushiki Kaisha. Blower. 4,573,869, Cl. 415-182.000.
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, to Kabushiki Kaisha Kobe Seiko Sho. Method for electromagnetically stirring molten steel in continuous casting. 4,573,515, Cl. 164-468.000.
Kitchin, Dwight W., to Aspen Laboratories, Inc. Fluid pump. 4,573,888, Cl. 417-560.000.
Klem, Richard H. Anti-pitch suspension. 4,573,702, Cl. 280-697.000.
Kliever, Waldo W., to Hughes Aircraft Company. Dual field of view sensor. 4,574,197, Cl. 250-334.000.
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Nilsson, Karl-Ivar, 4,573,687, Cl. 273-184.00B.
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Klusman, Ronald W.: *See*—
Voorhees, Kent J.; and Klusman, Ronald W., 4,573,354, Cl. 73-432.00R.
KMW Aktiebolag: *See*—
Myren, Harry I., 4,574,033, Cl. 162-198.000.
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Knaus, Ernest, to Goodyear Aerospace Corporation. Collapsible storage tank. 4,573,508, Cl. 150-55.000.
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Nadas, Julius, 4,573,553, Cl. 188-59.000.
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Kobayashi, Kazuo, to Alps Electric Co., Ltd. Carriage driving apparatus. 4,573,368, Cl. 74-108.000.
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Kobayashi, Kiyoshi: *See*—
Saeki, Kimihiro; and Kobayashi, Kiyoshi, 4,573,230, Cl. 15-41.00R.
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Miller, Dennis; and Koch, Scott R., 4,573,250, Cl. 29-447.000.
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Asada, Takafumi; Yoshida, Churyo; Koda, Minoru; and Ohno, Hideaki, 4,573,807, Cl. 384-100.000.
Kodera, Kimio, to Platinum Pen Co., Ltd. Cap assembly for a single or plural writing instruments. 4,573,818, Cl. 401-131.000.
Koh-I-Noor Rapidograph, Inc.: *See*—
Bruhn, Bernhard, 4,573,503, Cl. 141-24.000.
Kohler, Karl A.; and House, Richard F., to Container Corporation of America. Tamper-evident carton. 4,573,634, Cl. 229-38.000.
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Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, to Ricoh Co., Ltd. Tracking/focusing device for positioning an optical lens unit. 4,574,369, Cl. 369-44.000.
Koike, Eishi, to Ozen Corporation. Sound reproduction selection apparatus for a simplified sound reproducing device. 4,574,370, Cl. 369-65.000.
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Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,574,361, Cl. 364-761.000.
Todokoro, Shigeru; and Kojima, Tadashi, 4,574,206, Cl. 307-359.000.
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Kollmorgen Technologies Corporation: *See*—
DeLuca, Michael A.; and McCormack, John F., 4,574,094, Cl. 427-96.000.
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Kondo, Yoshihisa, to Alps Electric Co., Ltd. Intercharacter space processing apparatus for printers. 4,573,812, Cl. 400-121.000.
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Konge, Shinichi: *See*—
Morishita, Mitsuharu; and Konge, Shinichi, 4,574,275, Cl. 340-636.000.
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Konishi, Takao: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Konzak, Peter. Bird scaring device. 4,573,427, Cl. 116-22.00A.
Koong, Terrence H.: *See*—
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Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., to Ford Motor Company. Thermosetting coating composition useful as primer and chip resistant primer II'. 4,574,146, Cl. 525-530.000.
Korn, Heinrich. Chair with a height-adjustable back rest. 4,573,737, Cl. 297-353.000.
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Schultes, Tilmann; and Stiller, Klaus, 4,573,487, Cl. 135-24.000.
Kosano, Motohiko: *See*—
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Koshimo, Masahiko; and Murakami, Kiyoharu, to Kabushiki Kaisha Daikin Seisakusho. Vibration damper assembly. 4,573,374, Cl. 74-574.000.
Koster, William H.: *See*—
Kronenthal, David; Kuester, Paula L.; and Koster, William H., 4,574,153, Cl. 544-63.000.
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Kotaka, Ikuo, to Babcock-Hitachi Kabushiki Kaisha. Heat exchanger. 4,573,524, Cl. 165-96.000.
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Johnson, Carl W.; and Kotschi, Stanley W., 4,574,022, Cl. 156-164.000.
Kovac, Caroline A.: *See*—
Baum, Thomas H.; Houle, Frances A.; Jones, Carol R.; and Kovac, Caroline A., 4,574,095, Cl. 427-53.100.
Koyano, Akira: *See*—
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Kraftwerk Union Aktiengesellschaft: *See*—
Schwerdtner, Otto v.; and Dinstuhl, Klaus, 4,573,551, Cl. 181-218.000.
Kralick, James, to Mechanical Technology Incorporated. Combustion system. 4,573,320, Cl. 60-517.000.
Kramer, John H.: *See*—
Hamilton, Kent R.; and Kramer, John H., 4,573,271, Cl. 33-169.00C.
Krause, Charles A.; and Rajaram, Babu, to Zenith Radio Corporation. Selective page disable for a video display. 4,574,277, Cl. 340-703.000.
Krause, Hans-Peter: *See*—
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,574,124, Cl. 514-228.000.
Krauss, Timothy A.; and Kingston, Leo, to United States of America, Army. X-Wing aircraft circulation control. 4,573,871, Cl. 416-20.00R.
Kress-Electrik GmbH & Co.: *See*—
Binder, Alfred, 4,574,226, Cl. 318-317.000.
Krol, Thomas C. Percutaneous gastrostomy kit. 4,573,576, Cl. 206-471.000.
Kronenthal, David; Kuester, Paula L.; and Koster, William H., to E. R. Squibb & Sons, Inc. 8-Oxo-2-oxa-1-azabicyclo(4.2.0)octane-3-carboxylic acids. 4,574,153, Cl. 544-63.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Weiss, Wilhelm, 4,573,486, Cl. 134-104.000.
Krug, Russell R., to Chevron Research Company. Method for spent catalyst treating for fluidized catalytic cracking systems. 4,574,044, Cl. 208-120.000.
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Substituted O-acylglycosylamides, pharmaceutical compositions and method of use. 4,574,122, Cl. 514-42.000.
Kruschik, Klaus: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,573,701, Cl. 280-616.000.
Krutchen, Charles M.; Ranjan, Raj; and Yang, Jan-Chin, to Mobil Oil Corporation. Melt rheometer control. 4,573,345, Cl. 73-56.000.
Kubo, Takeharu: *See*—
Sueoka, Tetsuro; and Kubo, Takeharu, 4,574,296, Cl. 357-38.000.
Kubota, Ltd.: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,573,547, Cl. 180-168.000.
Kuester, Paula L.: *See*—
Kronenthal, David; Kuester, Paula L.; and Koster, William H., 4,574,153, Cl. 544-63.000.
Kuhlman Corporation: *See*—
Cochran, John P.; and Macemon, Herbert J., 4,573,757, Cl. 339-126.0RS.
Kukoleck, Dennis G.: *See*—
Port, John H.; Kukoleck, Dennis G.; and Guezuraga, Robert M., 4,574,388, Cl. 378-144.000.
Kumihara Safe Co., Inc.: *See*—
Masachika, Hiroshi, 4,573,416, Cl. 109-66.000.
Kunst, Robert J.; Lahey, Gerald F.; and Wille, Herbert S., to Pullman Standard, Inc. Railway car underframe adapted for use with couple or drawbar construction. 4,573,594, Cl. 213-51.000.
Kuraray Co., Ltd.: *See*—
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,574,139, Cl. 525-61.000.
Kurimoto, Ltd.: *See*—
Tadokoro, Yoshiharu, 4,573,492, Cl. 137-239.000.
Kurimoto, Mamoru: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,574,016, Cl. 148-144.000.
Kuroda, Kouki: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,573,788, Cl. 355-14.00R.
Kurt Wolf & Co. KG: *See*—
Wolf, Kurt; and Andre, Wolfram K., 4,574,184, Cl. 219-440.000.
Kusazaki, Yoshimasa: *See*—
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, 4,574,309, Cl. 358-212.000.
Kusz, Maximillian, to Owens-Illinois, Inc. Ring seal tamper indicating device. 4,573,582, Cl. 206-807.000.
Kuzmenko, Arnold: *See*—
Pfister, Jorg; and Kuzmenko, Arnold, 4,573,245, Cl. 28-187.000.
KW Marketing Incorporated: *See*—
Lamb, Kenneth A., Jr., 4,573,987, Cl. 604-378.000.
Kwiatek, Alfred; and Schwartz, Jack W., to Jonergin, Inc. Device for the administration of an active agent to the skin or mucosa. 4,573,996, Cl. 604-897.000.
LaBate, Micheal D. Slag and hot metal runner systems. 4,573,668, Cl. 266-196.000.
Labelle, Henri M. R. Vertical closure hinge with an anti-binding feature. 4,573,240, Cl. 16-355.000.
Laboratoire Spad: *See*—
Mezi, Michel A., 4,573,973, Cl. 604-197.000.
Laboratories Merck Sharp & Dohme - Chibret: *See*—
Paoletti, Jean-Claude, 4,573,506, Cl. 141-98.000.
Lacey, Ralph W., to Dijet Industrial Co., Ltd. Cutter blade. 4,573,831, Cl. 407-42.000.
LaCount, Clifford E.: *See*—
Dayton, Douglas C.; LaCount, Clifford E.; and McConchie, Burton G., 4,574,318, Cl. 358-285.000.
Lacy, Ernest R.: *See*—
Howell, Cecil A.; and Lacy, Ernest R., 4,573,847, Cl. 414-63.000.
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., to Eaton Corporation. Raised split gate EFET and circuitry. 4,574,208, Cl. 307-577.000.
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., to Eaton Corporation. Split gate EFET and circuitry. 4,574,209, Cl. 307-577.000.
Lade, Robert W.: *See*—
Benjamin, James A.; Schutten, Herman P.; and Lade, Robert W., 4,574,207, Cl. 307-577.000.
Lahey, Gerald F.: *See*—
Kunst, Robert J.; Lahey, Gerald F.; and Wille, Herbert S., 4,573,594, Cl. 213-51.000.
Lake, Norman M. Nasal sealer and filter. 4,573,461, Cl. 128-201.180.
Lam, Kit S.: *See*—
Kaplan, Henry S.; Teng, Nelson N. H.; Lam, Kit S.; and Calvo-Riera, Francisco, 4,574,116, Cl. 435-68.000.
Lamb, Kenneth A., Jr., to KW Marketing Incorporated. Reusable multi-layered diaper with wicking action. 4,573,987, Cl. 604-378.000.
Lamb, Steve; Moore, Robert R.; and La Porte, Frank, Jr. Lower extremity muscle conditioner device. 4,573,678, Cl. 272-96.000.
Lamb Technicon Corp.: *See*—
Anderson, Paul L., 4,573,862, Cl. 414-753.000.
Skrentner, Frank C., 4,573,840, Cl. 409-200.000.
Lamle, Stewart M.; and Setteducati, Mark. Educational puzzle cube. 4,573,683, Cl. 273-157.00R.
Lamphier, Wilbur N. Closed circuit heating system. 4,573,635, Cl. 237-70.000.
Landwehr, Gotz: *See*—
Lindemann, Bernd; Landwehr, Gotz; and Kaiser, Hans-Georg, 4,573,386, Cl. 83-833.000.
Lane, Jeffrey A., to Lucas Industries, Ltd. Bearings for gear pumps. 4,573,889, Cl. 418-73.000.
Lang, Hans-Jochen: *See*—
Seuring, Bernhard; Lang, Hans-Jochen; Hropot, Max; and Muschaweck, Roman, 4,574,128, Cl. 514-469.000.
Lange, Robert E.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,573,403, Cl. 100-43.000.
Lankton, Gordon B.; and Paradis, Joseph R., to Nypro Inc. Close pitch harnessing device. 4,573,242, Cl. 24-16.0PB.
La Porte, Frank, Jr.: *See*—
Lamb, Steve; Moore, Robert R.; and La Porte, Frank, Jr., 4,573,678, Cl. 272-96.000.
Large, Michael S.: *See*—
Edwards, Philip N.; and Large, Michael S., 4,574,123, Cl. 514-210.000.
Laroche, Pierre, to Glaverbel. Compositions incorporating glass beads and methods of preparing them. 4,574,109, Cl. 428-325.000.
Larsen, Hugh W.: *See*—
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., 4,573,842, Cl. 410-23.000.
Larson, James W.: *See*—
Tischer, James C.; and Larson, James W., 4,573,324, Cl. 62-115.000.
Larsson, Erik J., to Safe Bridge AB. Floating boom. 4,573,426, Cl. 114-267.000.
Lasso, Eugene R.; and Pitsko, John J., to Fuller Company. Blender bulk feed valve. 4,573,800, Cl. 366-101.000.
Laten, Bobby W.; and Prater, Johnny L., to United States of America, Army. Fiber deployment mechanism. 4,573,647, Cl. 244-3.120.
Lawler, Terry E.: *See*—
Gibbon, John D.; Lawler, Terry E.; Yoon, Hyun-Nam; and Charbonneau, Larry F., 4,574,066, Cl. 264-85.000.
Lawrence, James D., to Dailey Petroleum Services Corporation. Method and apparatus for flushing a well. 4,573,536, Cl. 166-373.000.
Lawrence, Peter Robin Broughton: *See*—
Adams, Brian W., 4,574,151, Cl. 536-31.000.
Lazarus, Wayne H.: *See*—
Frist, Brian S.; and Lazarus, Wayne H., 4,573,975, Cl. 604-192.000.
LeBlanc, James C.; and LeBlanc, Richard S., to General Motors Corporation. Turret control system. 4,573,397, Cl. 89-41.120.
LeBlanc, Richard S.: *See*—
LeBlanc, James C.; and LeBlanc, Richard S., 4,573,397, Cl. 89-41.120.
Lechaton, John S.; Pitner, Philip M.; and Srinivasan, Gurumakonda R., to International Business Machines Corporation. Method for making a high performance transistor integrated circuit. 4,573,256, Cl. 29-576.00B.
Leco Corporation: *See*—
Bredeweg, Roger L., 4,573,910, Cl. 432-156.000.
Lee, Chi-Long; Lim, Thomas F.; and Wright, Antony P., to Dow Corning Corporation. Fluorinated organosiloxane copolymers. 4,574,149, Cl. 528-42.000.
Lee, Graham L.; Shuttlewood, Jeffrey R.; and Ambrose, John W., to APV Burnett & Rolfe Ltd. Container washing and filling machine. 4,573,505, Cl. 141-92.000.
Lee, Shou-Yuan: *See*—
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Wo, Chee-Yuan, 4,574,141, Cl. 525-252.000.
Leem, Tae Y. Pencil case. 4,573,571, Cl. 206-214.000.
le Faou, Daniel: *See*—
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Lehmann, Werner; Fecker, Rainer; and Fuss, Manfred, to Mathias Bauerle GmbH. Paper folding machine. 4,573,672, Cl. 270-45.000.
Leifheit AG: *See*—
Denter, Ulrich; and Schulein, Rolf-Gunter, 4,573,387, Cl. 83-856.000.
Leiter Swank Industries, Inc.: *See*—
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Leland Stanford Jr. University, The Board of Trustees of the: *See*—
Kaplan, Henry S.; Teng, Nelson N. H.; Lam, Kit S.; and Calvo-Riera, Francisco, 4,574,116, Cl. 435-68.000.
Le Marquis, Jean-Claude: *See*—
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Lemke, Otto; Stalherm, Dieter; and Haack, Reimer, to Carl Still GmbH & Co. KG, Firma. Method for monitoring the reversal system of coke oven batteries. 4,574,034, Cl. 201-1.000.
Lensky, Albert: *See*—
Olesen, Paul; Lensky, Albert; and Pendzich, Richard J., 4,573,625, Cl. 227-131.000.
Leone-Bay, Andrea; and Timony, Peter E., to Stauffer Chemical Company. Herbicidal esters of N-substituted 2-bromo-4-methylimidazole-5-carboxylic acid. 4,574,010, Cl. 71-92.000.
Leschonski, Kurt; and Rothele, Stephan. Apparatus for producing a gas solid two phase flow jet having a constant mass or volume flow rate and predetermined velocity. 4,573,801, Cl. 366-154.000.

Leskovec, Robert A.: *See—*
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.

Levenberg, Nat. Chair for handicapped persons. 4,573,736, Cl. 297-339.000.

Levine, Stephen N., to Motorola, Inc. Multiple frequency digital phase locked loop. 4,574,243, Cl. 328-155.000.

Lewis, Kermit E.; and Roberts, Arthur S., Jr., to Lewis, Kermit E., a part interest. Automatic pill dispenser and method of administering medical pills. 4,573,606, Cl. 221-2.000.

Leybold-Heraeus GmbH: *See—*
Spruck, Helmut, 4,574,178, Cl. 219-121.0ET.

L'Garde, Inc.: *See—*
Hirasuna, Alan R.; and Veal, Gordon R., 4,573,537, Cl. 166-387.000.

Libove, Joel M.; and Singer, Jerome R., to University of California, The Regents of the. Method for flow measurement using nuclear magnetic resonance. 4,574,240, Cl. 324-306.000.

Lichtenstein, Joseph: *See—*
Gordon, Marvin; and Lichtenstein, Joseph, 4,573,658, Cl. 251-95.000.

Lichy, Dale. Locks for articulated rolling grilles. 4,573,512, Cl. 160-133.000.

Liddiard, Kevin C., to Commonwealth of Australia, The. Infrared radiation detector. 4,574,263, Cl. 338-18.000.

Liebhardt, Josef; and Fuhrer, Rudolf, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Safety device for a weapon detonator or fuse. 4,573,411, Cl. 102-256.000.

Lienhard, Robert W., to Swiss Fabricating, Inc. Framework for building construction. 4,573,294, Cl. 52-93.000.

Lietzau, Joachim, to Mannesmann AG. Tower crane with hammer head adaptation. 4,573,593, Cl. 212-239.000.

Lifshitz, Ran: *See—*
Baker, Ralph; and Lifshitz, Ran, 4,574,083, Cl. 424-93.000.

Lim, Thomas F.: *See—*
Lee, Chi-Long; Lim, Thomas F.; and Wright, Antony P., 4,574,149, Cl. 528-42.000.

Lindemann, Bernd; Landwehr, Gotz; and Kaiser, Hans-Georg, to Andreas Stihl. Saw chain for a power-driven chain saw. 4,573,386, Cl. 83-833.000.

Linger, Virgil S. Vehicle suspensions. 4,573,703, Cl. 280-701.000.

Lipschutz, James N., to Record Industrial Company. Distance measuring system using ultrasonic ranging. 4,574,368, Cl. 367-108.000.

Litton, Bruce W. Thumb and finger extension device. 4,573,459, Cl. 128-92.00A.

Litton Systems, Inc.: *See—*
Anderson, Robert H., 4,574,312, Cl. 358-213.000.
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Lockhoff, Oswald: *See—*
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.

Loctite (Ireland) Ltd.: *See—*
Charnock, Ronald S., 4,574,142, Cl. 525-305.000.

Logue, Murl F. Shower head. 4,573,639, Cl. 239-428.500.

Long Reach Manufacturing Co.: *See—*
Sinclair, Stuart W., 4,573,858, Cl. 414-620.000.

Longford, James B.: *See—*
Jones, Michael D.; and Longford, James B., 4,573,828, Cl. 405-293.000.

Loomis, Gary S.: *See—*
Hill, William D.; Mercanti, William A., Jr.; Apple, Christian K.; and Loomis, Gary S., 4,574,068, Cl. 376-259.000.

Lord, Barry: *See—*
Riley, Alfred T.; and Lord, Barry, 4,573,684, Cl. 273-157.00R.

Lord, Peter C.: *See—*
Fischell, Robert E.; and Lord, Peter C., 4,573,994, Cl. 604-891.000.

Lorenz, Gary. Gantries for hauling heavy loads over fixed paths. 4,573,853, Cl. 414-460.000.

Lorenz, Rainer, to Palitex Project-Company GmbH. Yarn wetting device particularly for use in a two-for-one twister. 4,573,314, Cl. 57-296.000.

Lorenzo, John L.: *See—*
Coppola, Vincent G.; Lorenzo, John L.; Grisgraber, Edwin G.; and Manduley, Flavio M., 4,574,352, Cl. 364-466.000.

Lotto, Ronald L.: *See—*
Mory, Steven W.; and Lotto, Ronald L., 4,573,955, Cl. 493-204.000.

Love, John F.: *See—*
Karrasch, Frank; and Love, John F., 4,573,980, Cl. 604-256.000.

Lovelace, Donald E.; Schexnayder, Michael C.; and Snyder, George W., to United States of America, Army. Plug nozzle kinetic energy penetrator rocket. 4,573,412, Cl. 102-374.000.

Lower, Jerry L., to Zimmer, Inc. Bone fixation plate. 4,573,458, Cl. 128-92.00D.

LTV Aerospace and Defense Company: *See—*
Murray, William J., 4,574,029, Cl. 156-500.000.

Lucas, Amand A.; Rife, Jack C.; and Donnelly, Stephen E. Method and device for producing photons in the ultraviolet-wavelength range. 4,574,198, Cl. 250-493.100.

Lucas Industries, Ltd.: *See—*
Lane, Jeffrey A., 4,573,889, Cl. 418-73.000.

Lucas Industries Public Limited Company: *See—*
Homes, Graham D., 4,573,659, Cl. 251-129.020.
Howes, Peter, 4,573,444, Cl. 123-502.000.

Lucas, Wayne M.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.

Ludecke, Otto A., to General Motors Corporation. Diesel exhaust cleaner and regeneration burner system with indexing particulate trap. 4,573,317, Cl. 60-303.000.

Ludwig, Albert R., to General Signal Corporation. Ball valve. 4,573,498, Cl. 137-625.470.

Luken, Clement H., Jr.: *See—*
Kinsman, Donald V.; and Luken, Clement H., Jr., 4,574,053, Cl. 252-134.000.

Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,573,403, Cl. 100-43.000.

Lund, David: *See—*
Mullane, William E.; and Lund, David, 4,573,260, Cl. 29-623.100.

Lundblad, Leif. Arrangement for dispensing sheets from a store thereof, for example bank notes. 4,573,848, Cl. 414-104.000.

Lunenschloss, Joachim: *See—*
Brockmanns, Karl-Josef; and Lunenschloss, Joachim, 4,573,312, Cl. 57-5.000.

Luongo, Michael C., to Westinghouse Electric Corp. Turbine blade vibration detection apparatus. 4,573,358, Cl. 73-660.000.

Lyng, William E. Locker handle assembly. 4,573,722, Cl. 292-148.000.

M/A-COM, Inc.: *See—*
Cloutier, Donald C., 4,574,258, Cl. 333-21.00A.

M.A.N. Maschinenfabrik Augsburg-Nurnberg: *See—*
Grathoff, Hartmut, 4,573,743, Cl. 299-39.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Bezler, Wilhelm; and Stark, Ewald, 4,573,408, Cl. 101-248.000.

Ma, Hansan, to Idesign, Inc. Portable security box. 4,573,332, Cl. 70-30.000.

Maag, Wilhelm; and Straub, Paul, to Gebruder Buhler AG. Chain for a flight conveyor. 4,573,568, Cl. 198-731.000.

Maasberg, Wolfgang; and Huperz, Adalbert, to Woma-Apparatebau Wolfgang Massberg & Co. GmbH. Valve assembly for high pressure pump. 4,573,886, Cl. 417-454.000.

Mabuchi Motor Co., Ltd.: *See—*
Mabuchi, Takaichi, 4,574,215, Cl. 310-239.000.

Mabuchi, Takaichi, to Mabuchi Motor Co., Ltd. Brushgear for miniature motors. 4,574,215, Cl. 310-239.000.

Macdon Industries Ltd.: *See—*
Patterson, Roger L., 4,573,309, Cl. 56-228.000.

MacDonald, Richard A.: *See—*
Gondert, Theodore R.; and MacDonald, Richard A., 4,573,730, Cl. 296-1.00S.

Macemon, Herbert J.: *See—*
Cochran, John P.; and Macemon, Herbert J., 4,573,757, Cl. 339-126.0RS.

Machida, Tetsuo: *See—*
Tabata, Kuniaki; Tsuhara, Susumu; Machida, Tetsuo; Iwami, Hidefumi; and Okada, Yasuyuki, 4,574,364, Cl. 364-900.000.

Mackereth, Thomas C., to U.S. Philips Corporation. Television signal encoder. 4,574,302, Cl. 358-21.00R.

Maddin, Charles M.: *See—*
Crowe, Curtis W.; and Maddin, Charles M., 4,574,050, Cl. 252-8.55C.

Maddison, David; and Dawson, Christopher, to Kimberly-Clark Limited. Liquid soap dispenser. 4,573,612, Cl. 222-94.000.

Madsen, Bruce S.: *See—*
Dorey, John K., II; Huneke, James T.; Madsen, Bruce S.; and Schaaf, Theodore F., 4,574,031, Cl. 156-655.000.

Maier, Winfried, to Endress u. Hauser GmbH u. Co. Sensor for capacitively measuring the level of material in a container. 4,574,328, Cl. 361-284.000.

Maikuma, Yoshimata: *See—*
Amano, Itaru; Maikuma, Yoshimata; Ozaki, Keiji; and Ohnishi, Hisaaki, 4,573,859, Cl. 414-628.000.

Majorica, S.A.: *See—*
Plaza, Jaime P., 4,573,243, Cl. 24-116.00A.

Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, to Platinum Pen of America, Inc. Mechanical pencil. 4,573,817, Cl. 401-65.000.

Malachowski, Jerome A.; and Horvatis, James F., to Buffalo Brake Beam. Brake rigging for a railway vehicle truck. 4,573,555, Cl. 188-52.000.

Malhotra, Satish K., to Steyr-Daimler-Puch Aktiengesellschaft. Pistol and grip-and-trigger guard assembly. 4,573,280, Cl. 42-7.000.

Mall, Gunther; Dietrich, Herbert; and Stephan, Willi, to Pfaff Industriemaschinen GmbH. Sewing machine device for making garments with pleats. 4,573,421, Cl. 112-146.000.

Manduley, Flavio M.: *See—*
Coppola, Vincent G.; Lorenzo, John L.; Grisgraber, Edwin G.; and Manduley, Flavio M., 4,574,352, Cl. 364-466.000.

Manke, Kevin R., to Halliburton Company. Sleeve-type low pressure responsive APR tester valve. 4,573,535, Cl. 166-321.000.

Mannesmann AG: *See—*
Lietzau, Joachim, 4,573,593, Cl. 212-239.000.

Mannesmann Tally Corporation: *See—*
Shin, Warren J., 4,573,363, Cl. 74-1.0SS.

Mans, Thomas A.: *See—*
Arnold, Jeffrey M.; Brosnahan, James R.; Koong, Terrence H.; Mans, Thomas A.; and Milo, Theodore A., 4,573,478, Cl. 128-670.000.
Mantel Machine Products, Inc.: *See—*
Mantel, Robert W., 4,573,392, Cl. 86-43.000.
Mantel, Robert W., to Mantel Machine Products, Inc. In-line bullet feeder. 4,573,392, Cl. 86-43.000.
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., to General Motors Corporation. Resilient tie-down device. 4,573,842, Cl. 410-23.000.
Marathon Oil Company: *See—*
Jones, Stanley C., 4,573,342, Cl. 73-38.000.
Marconi Instruments Limited: *See—*
Smith, John L.; and Jenner, Frank H., 4,573,756, Cl. 339-117.00P.
Mares, Frank: *See—*
Boyle, William J., Jr.; Mares, Frank; and Wallo, Andrea M., 4,574,060, Cl. 558-457.000.
Marinari, Diane L.: *See—*
Grohoski, Jane L.; and Marinari, Diane L., 4,573,267, Cl. 30-133.000.
Marks, Alvin M. Ordered dipolar light-electric power converter. 4,574,161, Cl. 136-263.000.
Marley, Clement F. Mechanical chimney sweep control. 4,573,232, Cl. 15-163.000.
Marti, Juan P. Fastening device for pourer plugs. 4,573,615, Cl. 222-566.000.
Martin Engineering Company: *See—*
Swinderman, Robert T., 4,573,567, Cl. 198-860.400.
Martin, John C.; and Jett, James H., to United States of America, Energy. Apparatus for eliminating background interference in fluorescence measurements. 4,573,796, Cl. 356-318.000.
Martinez, Francisco J.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.
Maruyama, Takashi, to Chinon Kabushiki Kaisha. Focusing controlling device. 4,573,783, Cl. 354-403.000.
Marx, Gunter H., to Solco Basel AG. Apparatus for receiving and reinfusing blood. 4,573,992, Cl. 604-408.000.
Marzendorfer, Hans; and Schaller, Werner, to Steirische Wasserkraft- und Elektrizitaets-AG. Method of and apparatus for reheating desulfurized waste gas. 4,573,418, Cl. 110-345.000.
Masachika, Hiroshi, to Kumihara Safe Co., Inc. After hour depository. 4,573,416, Cl. 109-66.000.
Masaki, Kazumi, to Hayashibara, Ken. Phase-regulated switching circuit. 4,574,230, Cl. 323-242.000.
Mason, Arvil B.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.
Massaro, Vito. Modular storage rack for tapes. 4,573,749, Cl. 312-12.000.
Masuda, Akira: *See—*
Matsumura, Toshimi; Miyaki, Masahiko; and Masuda, Akira, 4,573,442, Cl. 123-450.000.
Masuda, Yutaka; and Nakamura, Teruo, to Toray Industries, Inc. Pile fabric production process. 4,574,018, Cl. 156-72.000.
Masuzawa, Takahisa; and Tsuchiya, Ichiro, to University of Tokyo. Ion beam machining device. 4,574,179, Cl. 219-121.0PG.
Mathias Bauerle GmbH: *See—*
Lehmann, Werner; Fecker, Rainer; and Fuss, Manfred, 4,573,672, Cl. 270-45.000.
Matray, Attila: *See—*
Endres, Dan D.; and Matray, Attila, 4,574,021, Cl. 156-152.000.
Matsuda, Terumi: *See—*
Arakawa, Satoshi; Matsuda, Terumi; Ishizuka, Akio; and Shibahara, Yoshihiko, 4,574,102, Cl. 428-212.000.
Teraoka, Masanori; and Matsuda, Terumi, 4,574,195, Cl. 250-327.200.
Matsui, Kazuma: *See—*
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Matsumi Electric Co.: *See—*
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Matsumoto, Masao, to Yoshida Kogyo K.K. Apparatus for forming gaps in a slide fastener chain. 4,573,383, Cl. 83-11.000.
Matsumura, Toshimi; Miyaki, Masahiko; and Masuda, Akira, to Nippondenso Co., Ltd. Fuel injection pump having a compact spill-port timing control unit. 4,573,442, Cl. 123-450.000.
Matsunaga, Shoichi: *See—*
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.
Matsuo, Katsuyoshi: *See—*
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, 4,573,515, Cl. 164-468.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Asada, Takafumi; Yoshida, Churyo; Koda, Minoru; and Ohno, Hideaki, 4,573,807, Cl. 384-100.000.
Hamazawa, Yoshikazu; Hirai, Tatsuro; Horikoshi, Tunenobu; and Ishida, Tomio, 4,574,262, Cl. 336-192.000.
Matsushita Refrigeration Company: *See—*
Uetuji, Toshio; and Ohkubo, Noriaki, 4,573,879, Cl. 417-312.000
Mattel, Inc.: *See—*
Crow, Granville; Renger, Larry H.; and Sweet, Roger H., 4,573,944, Cl. 446-465.000.
Matthews, Andrew J.; and Thomas, Simon A., to Edeco Holding, Limited. Thermochemical energy storage. 4,574,051, Cl. 252-70.000.
Matthews, James R.: *See—*
Schattschneider, George K.; and Matthews, James R., 4,574,356, Cl. 364-508.000.
Matthews, John S., Jr., to Goodyear Tire & Rubber Company, The. Tire display stand. 4,573,587, Cl. 211-24.000.
Matzdorf, Burghard: *See—*
Muller, Erwin; Zakrzewski, Czeslaw; and Matzdorf, Burghard, 4,573,624, Cl. 227-121.000.
Maubach, Peter: *See—*
Ruffer, Alfred; Maubach, Peter; Haas, Johannes; and Quester, Horst, 4,573,484, Cl. 131-327.000.
Maxon Corporation: *See—*
Coppin, William P.; and Karabin, Tadeusz, 4,573,907, Cl. 431-351.000.
May, Karl-Heinz: *See—*
Blasius, Udo; May, Karl-Heinz; and Rodi, Anton, 4,573,410, Cl. 101-365.000.
Mayo, Howard A., Jr., to Allis-Chalmers Corporation. Laterally movable powerhouse. 4,573,827, Cl. 405-78.000.
Mayon, Allen J., to Conque, Louis J.; and Vincent, Rodney P. Joy stick holder. 4,573,682, Cl. 273-148.00B.
Mazda Motor Corporation: *See—*
Akutagawa, Hitoshi, 4,573,371, Cl. 74-339.000.
Kanai, Seita; and Kanazawa, Hirotaka, 4,573,705, Cl. 280-708.000.
Mazzocco, Thomas R., to Staar Surgical Co. Methods for implantation of deformable intraocular lenses. 4,573,998, Cl. 623-6.000.
McCaffrey, Felim, to Hatch Associates Ltd. Method of and apparatus for continuous centrifugal casting. 4,573,523, Cl. 164-460.000.
McConchie, Burton G.: *See—*
Dayton, Douglas C.; LaCount, Clifford E.; and McConchie, Burton G., 4,574,318, Cl. 358-285.000.
McCormack, John F.: *See—*
DeLuca, Michael A.; and McCormack, John F., 4,574,094, Cl. 427-96.000.
McCormick, Daniel J.: *See—*
Valenti, Richard L.; and McCormick, Daniel J., 4,573,239, Cl. 16-273.000.
McDonald, Gerald R. Maintenance tool for inaccessible wheel valves. 4,573,378, Cl. 81-463.000.
McDonough, M. J. Heat exchanger closure connection. 4,573,527, Cl. 165-154.000.
McFarland, Robert E. Apparatus for loading a wheelchair or similar object. 4,573,854, Cl. 414-462.000.
McFarlane, Richard H. Protective sheath structure for a catheter assembly. 4,573,981, Cl. 604-263.000.
McGonigle, Thomas P. Convenience dinner container and method. 4,574,174, Cl. 219-10.55M.
McKee, Graham E.: *See—*
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, 4,574,131, Cl. 523-209.000.
McLachlan, Richard D.; Jewett, Gary L.; and Evans, John C., to Dow Chemical Company, The. Fiber-optic probe for sensitive Raman analysis. 4,573,761, Cl. 350-96.240.
McNally, George S.: *See—*
Hesch, Harold E.; and McNally, George S., 4,573,843, Cl. 410-58.000.
McNally, James C. Football training apparatus and methods of using same. 4,573,680, Cl. 273-55.00R.
McVay, William P.: *See—*
Golden, Donald M.; and McVay, William P., 4,573,469, Cl. 128-334.00C.
Mechanical Technology Incorporated: *See—*
Kralick, James, 4,573,320, Cl. 60-517.000.
Meckel, Walter, to Bayer Aktiengesellschaft. Process for the production of polyurethanes, polyurethanes containing terminal aromatic amino groups and their use. 4,574,147, Cl. 528-64.000.
Medical Engineering Corp.: *See—*
Finney, Roy P., 4,573,985, Cl. 604-349.000.
Mednis, Juris M., to Universal Symetrics Corporation. Mated container units. 4,573,595, Cl. 215-10.000.
Medrad, Inc.: *See—*
Reilly, David M., 4,573,978, Cl. 604-240.000.
Meeker, Paul K.: *See—*
Kochte, Werner W.; and Meeker, Paul K., 4,573,234, Cl. 15-323.000.
Mehoudar, Raphael, to Hydro-Plan Engineering Ltd. Irrigation emitter unit. 4,573,640, Cl. 239-542.000.
Mercanti, William A., Jr.: *See—*
Hill, William D.; Mercanti, William A., Jr.; Apple, Christian K.; and Loomis, Gary S., 4,574,068, Cl. 376-259.000.
Mercer, Frank B., to P.L.G. Research Limited. Plastics material mesh structure. 4,574,100, Cl. 428-134.000.
Merck & Co., Inc.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,574,127, Cl. 514-365.000.
Fisher, Michael H.; and Jacks, Thomas M., 4,574,125, Cl. 514-284.000.

Forbes, Alexander E.; and Haslam, John L., 4,573,982, Cl. 604-300.000.
Meritus Industries, Inc.: *See*—
Nottingham, John, 4,573,654, Cl. 248-231.100.
Merkator, Manfred; and Schmid, Karl, to Black & Decker Inc. Electromagnetic tacker. 4,573,621, Cl. 227-8.000.
Merkel, Volkmar: *See*—
Weikl, Andreas; and Merkel, Volkmar, 4,573,966, Cl. 604-53.000.
Meroni, Rico, to Forbo-Teppichwerk AG. Floor covering article. 4,573,299, Cl. 52-513.000.
Merrick, Edwin B.: *See*—
Dukes, John N.; and Merrick, Edwin B., 4,573,475, Cl. 128-653.000.
Merrien, Pierre A.: *See*—
Merrien, Pierre L.; and Merrien, Pierre A., 4,573,522, Cl. 164-456.000.
Merrien, Pierre L.; and Merrien, Pierre A., to Etude et Development en Metallurgie. Process and apparatus for automating a baking cycle under hot air of sand molds. 4,573,522, Cl. 164-456.000.
Merz, Eugen; Sandhaus, Sami; and Troger, Norbert. Occlusio-referential articulator. 4,573,915, Cl. 433-64.000.
Mesek, Virginia R.: *See*—
Pieniak, Heinz A.; and Mesek, Virginia R., 4,573,991, Cl. 604-385.00A.
Messer, Michelle. Unit dose medication dispenser. 4,573,580, Cl. 206-534.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
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Metal Box p.l.c.: *See*—
Adams, John F. E.; Proffit, Philip J. G.; Oakley, Nicholas R.; and Folland, Rickworth, 4,573,597, Cl. 215-12.00R.
Metalworking Lasers International Ltd.: *See*—
Katz, David, 4,574,381, Cl. 372-87.000.
Metzger, Karl G.: *See*—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.
Meunier, Paul L., to Thomson-CSF. Elastic surface wave force sensor. 4,573,357, Cl. 73-517.00R.
Meyer, Klaus, to Swiss Aluminium Ltd. Process for manufacturing coarse, crystalline alumina. 4,574,073, Cl. 423-111.000.
Meyer, Wolfgang K.; and Breyer, Fritz-Werner, to Sulzer Brothers Limited. Apparatus for logistical operations with textile machinery. 4,573,856, Cl. 414-561.000.
Meyers, Wayne E. Burner unit for fireplace simulation. 4,573,905, Cl. 431-125.000.
Mezi, Michel A., to Laboratoire Spad. Case for protecting a syringe body. 4,573,973, Cl. 604-197.000.
Michael, David J.: *See*—
Perry, John D.; and Michael, David J., 4,574,119, Cl. 501-114.000.
Michaels, John H.: *See*—
Bolton, Theodore S.; and Michaels, John H., 4,573,328, Cl. 62-263.000.
Mickelson, Wilmer A., to Rockwell International Corporation. Multisensor demodulator and A/D converter. 4,574,245, Cl. 329-110.000.
Micro Component Technology, Inc.: *See*—
Kelly, Thomas C.; Wurscher, Robert J.; Petrich, Dennis M.; and Rideout, Earl H., 4,574,235, Cl. 324-158.00F.
Microglass, Inc.: *See*—
Butler, Robert M., 4,573,851, Cl. 414-404.000.
Mid America Machine Corp.: *See*—
Johnson, Harold K., 4,573,956, Cl. 493-237.000.
Midgley, John A.; and Hulett, Richard H., to Raychem Corporation. Elongate electrical assemblies. 4,574,188, Cl. 219-549.000.
Mieyal, David F., to Donn Incorporated. Honeycomb floor panel and the like. 4,573,304, Cl. 52-807.000.
Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., to Tektronix, Inc. Method and apparatus for time-aligning data. 4,574,354, Cl. 364-481.000.
Mikalonis, Liudas K., to Transmatic, Inc. Cornice lighting fixture for mass transit vehicles. 4,574,336, Cl. 362-260.000.
Miller, Brian S.; and Dunn, Aubrey J., to United States of America, Army. Indium bump hybrid bonding method and system. 4,573,627, Cl. 228-102.000.
Miller, Daniel R., to Buckhorn Material Handling Group Inc. Stackable container. 4,573,577, Cl. 206-506.000.
Miller, Dennis; and Koch, Scott R. Method of repairing a piston shaft assembly of a railway car end-of-car cushioning unit. 4,573,250, Cl. 29-447.000.
Miller, Edward B.: *See*—
Beatty, Robert M.; Miller, Edward B.; and Huber, Paul G., 4,574,355, Cl. 364-492.000.
Miller, Gregory R. Vehicle communicator. 4,574,269, Cl. 340-97.000.
Miller, Lewis R.: *See*—
Kennard, Reed H.; and Miller, Lewis R., 4,573,365, Cl. 74-15.800.
Miller, Richard A.: *See*—
Kasner, William H.; Miller, Richard A.; and Toth, Vincent A., 4,574,180, Cl. 219-121.0LY.
Mills, Kenneth R.: *See*—
Wilcox, Kenneth W.; and Mills, Kenneth R., 4,574,134, Cl. 524-157.000.
Milo, Theodore A.: *See*—
Arnold, Jeffrey M.; Brosnahan, James R.; Koong, Terrence H.; Mani, Thomas A.; and Milo, Theodore A., 4,573,478, Cl. 128-670.000.
Minagawa, Kazushi: *See*—
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Minetola, James A.; and Tucker, David R., to Procter & Gamble Company, The. Disposable waste-containment garment. 4,573,986, Cl. 604-366.000.
Minister of National Defence of Her Majesty's Canadian Government: *See*—
Schattschneider, George K.; and Matthews, James R., 4,574,356, Cl. 364-508.000.
Minnesota Mining and Manufacturing Co.: *See*—
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Minolta Camera Kabushiki Kaisha: *See*—
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Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,573,786, Cl. 354-416.000.
Wada, Kenichi, 4,573,789, Cl. 355-14.0SH.
Minter, Mearl J.: *See*—
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Mishra, Amarendra: *See*—
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Mr. Christmas Incorporated: *See*—
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Mita Industrial Company, Ltd.: *See*—
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Mitsubishi Chemical Industries Ltd.: *See*—
Oguri, Yasuo; Awata, Mitsuru; and Ariyama, Noriyuki, 4,574,012, Cl. 106-120.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Tamura, Yukio; and Oono, Yoshihiro, 4,574,110, Cl. 428-402.210.
Miyaki, Masahiko: *See*—
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Miyamoto, Hiroshi; and Omata, Tadao, to ORC Manufacturing Co., Ltd. Sheet material transfer apparatus. 4,573,676, Cl. 271-179.000.
Miyamoto, Yasuo: *See*—
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Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, 4,574,156, Cl. 544-398.000.
Mizuno, Shinichi, to Olympus Optical Co., Ltd. Telephoto lens system. 4,573,770, Cl. 350-454.000.
Mnich, Axel: *See*—
Hoag, Robert E.; and Mnich, Axel, 4,573,993, Cl. 604-411.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Offenhauer, Robert D., 4,573,530, Cl. 166-260.000.
Chester, Arthur W.; Garwood, William E.; and Vartuli, James C., 4,574,043, Cl. 208-59.000.
Dellinger, Thomas B.; Hoppe, Eugene A.; and Jones, Charles E., 4,573,540, Cl. 175-61.000.
Kimmich, Karl C., 4,573,911, Cl. 432-179.000.
Krutchen, Charles M.; Ranjan, Raj; and Yang, Jan-Chin, 4,573,345, Cl. 73-56.000.
Peterson, Robert D.; and Penner, Wayne A., 4,574,358, Cl. 364-550.000.
Mock, Edward A., to Garrett Corporation, The. Steam generating apparatus and methods. 4,573,323, Cl. 60-665.000.
Moeller, Robert P.: *See*—
Burns, William K.; and Moeller, Robert P., 4,573,797, Cl. 356-350.000.
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Auch, Wilfried; Mohr, Friedemann; Schlemper, Eberhard; and Steudle, Walter, 4,573,795, Cl. 356-350.000.
Moisan, Louis E. Audible and visual indicator. 4,573,281, Cl. 43-17.000.
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Momose, Masao, to Kabushiki Kaisha Suwa Seikosha. Flexible magnetic disk drive. 4,574,323, Cl. 360-99.000.
Monolithic Memories, Inc.: *See*—
Hoberman, Barry A.; and Moss, William E., 4,574,367, Cl. 365-179.000.
Monsanto Company: *See*—
Gomez, I. Luis, 4,574,136, Cl. 524-310.000.
Montblanc-Simplo GmbH: *See*—
Herrnring, Gunther, 4,573,819, Cl. 401-151.000.
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Cortesi, Paolo; Donati, Gianni; and Saggese, Giuseppe, 4,574,078, Cl. 423-592.000.
Moore, Alan. Regenerative turbomachine. 4,573,864, Cl. 415-53.00T.

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Deighton, Guy A.; and Moore, Gerry W., 4,573,779, Cl. 354-4.000.
Moore, M. Samuel; and Paluka, Charles F., to Semco Instruments, Inc. Thermocouple isolation block system. 4,573,806, Cl. 374-144.000.
Moore, Paul E.: *See*—
Strohl, Robert L.; Moore, Paul E.; and Toth, Alexander, 4,573,665, Cl. 266-48.000.
Moore, Robert R.: *See*—
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Moran, James P., Jr.; and Holmes, Mark. Rapid cure acrylic monomer systems containing elemental aluminum metal. 4,574,138, Cl. 524-786.000.
Morbitzer, Hans P.: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,573,701, Cl. 280-616.000.
Mordini, Jacques: *See*—
Cristol, Benoit; and Mordini, Jacques, 4,574,074, Cl. 423-124.000.
Moreira, Anthony F., to International Shoe Machine Corporation. Side and heel lasting machine. 4,573,229, Cl. 12-8.100.
Morenus, Richard C.; and Frazer, Alson C., to Ford Aerospace and Communications Corp. Ram air combustion steering system for a guided missile. 4,573,648, Cl. 244-3.220.
Morganite Ceramic Fibres Limited: *See*—
Foy, Martin, 4,573,400, Cl. 98-60.000.
Mori, Shosuke; Awaga, Makoto; Fujisaku, Kiminori; Yamauchi, Mitsuru; and Ono, Hitoshi, to Fujitsu Limited. Data processing apparatus for performing high-speed arithmetic operations. 4,574,347, Cl. 364-200.000.
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Image display device. 4,574,281, Cl. 340-783.000.
Moriguchi, Haruhiko: *See*—
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,574,293, Cl. 364-76.0PH.
Morikawa, Tuneo: *See*—
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Morimoto, Yoshihumi: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Morimoto, Yoshiro: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Murasugi, Takashi; and Suzuki, Tadashi, 4,573,375, Cl. 74-863.000.
Morishige, Eiji: *See*—
Nomura, Hirokazu; Sato, Yukihiko; and Morishige, Eiji, 4,573,666, Cl. 266-80.000.
Morishima, Masaharu, to Funai Electric Company Limited. Stereophonic sound producing apparatus for a game machine. 4,574,391, Cl. 381-18.000.
Morishita, Mitsuharu; and Konge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Battery charge indicating circuit. 4,574,275, Cl. 340-636.000.
Morita, Masahiro: *See*—
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.
Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, to Wako Pure Chemical Industries, Ltd. Polymethoxybenzyl piperazine derivatives effective for improving blood circulation system. 4,574,156, Cl. 544-398.000.
Morita, Yoshiyuki; and Nakamura, Hiroshi, to Nippondenso Co., Ltd. System including bi-directional drive mechanism. 4,573,723, Cl. 292-336.300.
Morlock, Ruben D. Can crushing machine. 4,573,405, Cl. 100-157.000.
Moro, Norio: *See*—
Kajiyama, Koichi; Moro, Norio; Sajiki, Kazuaki; and Yamaguchi, Tadayoshi, 4,573,792, Cl. 356-301.000.
Morrison, Ronald D. Self-propelled vehicle. 4,573,437, Cl. 123-44.00B.
Morton Thiokol, Inc.: *See*—
Bresser, Robert E.; and Wursthorn, Karl R., 4,574,135, Cl. 524-182.000.
Mory, Steven W.; and Lotto, Ronald L., to FMC Corporation. Apparatus for stacking thermoplastic sheets. 4,573,955, Cl. 493-204.000.
Moss, William E.: *See*—
Hoberman, Barry A.; and Moss, William E., 4,574,367, Cl. 365-179.000.
Moss, William R.: *See*—
Jones, Donald A.; Wawra, Gerhard F.; and Moss, William R., 4,573,898, Cl. 425-145.000.
Motoori, Ryuzo: *See*—
Hashimoto, Takaaki; Motoori, Ryuzo; and Minagawa, Kazushi, 4,574,303, Cl. 358-29.000.
Motor Wheel Corporation: *See*—
Daudi, Anwar R., 4,573,338, Cl. 72-333.000.
Motorola, Inc.: *See*—
Hess, Robert M.; and Jarrett, Robert B., 4,574,221, Cl. 315-209.00T.
Hulseweh, Terry S., 4,573,257, Cl. 29-576.00E.
Jason, Barry L., 4,574,251, Cl. 330-279.000.
Levine, Stephen N., 4,574,243, Cl. 328-155.000.
Petty, Thomas J., 4,574,232, Cl. 323-268.000.
Siwiak, Kazimierz, 4,574,290, Cl. 343-827.000.
Valentine, Richard J., 4,574,266, Cl. 340-52.00F.
Moussa, Zaher M., to Elliott Turbomachinery Co., Inc. Solid turbine wheel with guided discharge. 4,573,870, Cl. 415-202.000.
Mowill, Rolf J.: *See*—
Stroem, Sigmunn; and Mowill, Rolf J., 4,573,868, Cl. 415-157.000.
Muellenberg, Ralph. Apparatus for mounting a disk to a shaft. 4,573,825, Cl. 403-370.000.
Mukasa, Kohsuke: *See*—
Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, 4,573,422, Cl. 114-65.00R.
Mullane, William E.; and Lund, David, to Taylor-Winfield Corporation, The. Induction heated intercell fusion for lead/acid storage battery. 4,573,260, Cl. 29-623.100.
Muller, Erwin; Zakrzewski, Czeslaw; and Matzdorf, Burghard, to Erwin Muller GmbH & Co. Portable electric stapler. 4,573,624, Cl. 227-121.000.
Muller, Norbert: *See*—
Henkel, Hans-Joachim; and Muller, Norbert, 4,574,111, Cl. 428-461.000.
Muller, Rolf; and Wurdak, Reinhold, to Papst-Motoren GmbH & Co. KG. Brushless D.C. motor. 4,574,211, Cl. 310-68.00R.
Multi-Elmac Company: *See*—
Jacob, Keith, 4,574,247, Cl. 329-126.000.
Murakami, Hideyo: *See*—
Irie, Kazunari; Taka, Masahiro; and Murakami, Hideyo, 4,574,383, Cl. 375-27.000.
Murakami, Kiyoharu: *See*—
Koshimo, Masahiko; and Murakami, Kiyoharu, 4,573,374, Cl. 74-574.000.
Muraki, Hideaki: *See*—
Takahashi, Hideaki; Kondo, Haruyoshi; Takeuchi, Takashi; Hayakawa, Kiyoharu; and Muraki, Hideaki, 4,574,264, Cl. 338-34.000.
Murasugi, Takashi: *See*—
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Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, to Hitachi Zosen Corporation. Ship without transverse reinforcing members between the inner and outer hull plating. 4,573,422, Cl. 114-65.00R.
Murata, Toshinori; Kazumi, Masafumi; and Ito, Yuji, to Hitachi, Ltd. Signal transfer system using a charge transfer device. 4,574,384, Cl. 377-58.000.
Murdick, Brian K.; and Haase, William H., to International Paper Company. Taco tray. 4,573,579, Cl. 206-525.000.
Murphy Management, Inc.: *See*—
Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,573,489, Cl. 137-59.000.
Murray, Russell: *See*—
Gignoux, Dominique; and Murray, Russell, 4,574,387, Cl. 378-56.000.
Murray, William J., to LTV Aerospace and Defense Company. Apparatus for forming concave tape wrapped composite structures. 4,574,029, Cl. 156-500.000.
Musashi Engineering Kabushiki Kaisha: *See*—
Nogi, Hiroyoshi; and Tanaka, Shigeru, 4,573,674, Cl. 271-118.000.
Muscat, Peter P. Convertible top frame. 4,573,732, Cl. 296-108.000.
Muschaweck, Roman: *See*—
Seuring, Bernhard; Lang, Hans-Jochen; Hropot, Max; and Muschaweck, Roman, 4,574,128, Cl. 514-469.000.
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Musto, Joseph A.; Scarella, Robert A.; Jacquett, Harold W.; Riolo, Angelo V.; and Della Fave, Nicholas L, to General Foods Corporation. Process for preparing a liquid coffee aroma. 4,574,089, Cl. 426-386.000.
Myochin, Hisashi; and Seino, Kuniki, to Minolta Camera Kabushiki Kaisha. Electrical charging apparatus for electrophotography. 4,574,326, Cl. 361-229.000.
Myren, Harry I., to KMW Aktiebolag. Method and apparatus for delivering a multilayer jet of stock to a forming surface in a papermaking machine. 4,574,033, Cl. 162-198.000.
N.C.A. Co., Ltd.: *See*—
Kikuchi, Hidetomo, 4,573,618, Cl. 226-42.000.
N P S P po Hydroplastichna Obrabotka na Metalite: *See*—
Petkov, Georgi K.; Netzov, Nikola M.; Botev, Botyo P.; and Bankovski, Dimiter N., 4,573,841, Cl. 409-244.000.
Nabisco Brands, Inc.: *See*—
Steensen, Wayne L.; and Weaver, Ronald C., 4,574,091, Cl. 426-548.000.
Nadas, Julius, to Knorr-Bremse GmbH. Disc brake. 4,573,553, Cl. 188-59.000.
Nagahira, Jyoji: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,573,788, Cl. 355-14.00R.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Temperature detecting transistor circuit. 4,574,205, Cl. 307-310.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,573,949, Cl. 474-80.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Chain guide in a front derailleur. 4,573,950, Cl. 474-80.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,573,951, Cl. 474-82.000.
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, to Canon Kabushiki Kaisha. Image forming device. 4,573,788, Cl. 355-14.00R.
Nagel, Dietmar: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,573,943, Cl. 446-463.000.

Nagumo, Masahide: *See*—
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,574,361, Cl. 364-761.000.
Nair, Xina; and Temple, Davis L., Jr., to Bristol-Myers Company. Topical nonsteroidal anti-inflammatory methods. 4,574,129, Cl. 514-540.000.
Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,573,786, Cl. 354-416.000.
Nakamats, Yoshiro. Putting training device for golfers. 4,573,686, Cl. 273-184.00A.
Nakamura, Hiroshi: *See*—
Morita, Yoshiyuki; and Nakamura, Hiroshi, 4,573,723, Cl. 292-336.300.
Nakamura, Teruo: *See*—
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Nakamura, Toshiaki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,573,882, Cl. 417-366.000.
Nakano, Kazuo: *See*—
Watanabe, Haruo; Nakano, Kazuo; and Ohnishi, Akito, 4,573,443, Cl. 123-492.000.
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, to Toyoda Gosei Co., Ltd. Dust boot with multiple layer construction of bellows. 4,573,693, Cl. 277-212.0FB.
Nakata, Yuji, to Tokyo Shibaura Denki Kabushiki Kaisha. High temperature heat resistant structure. 4,573,872, Cl. 416-96.00A.
Nakazawa, Toru: *See*—
Tsutsumi, Masahiro; Nakazawa, Toru; and Utsunomiya, Yasuharu, 4,574,114, Cl. 430-81.000.
Nalco Chemical Company: *See*—
Ries, Donald G., 4,574,061, Cl. 260-512.00C.
Nam, Kyong H. Self-optimizing electrode and pulse-stabilized super high power C.W. gas lasers. 4,574,380, Cl. 372-87.000.
Namekawa, Koroku; Koyano, Akira; and Kasai, Chihiro, to Aloka Co., Ltd. Ultrasonic diagnostic apparatus. 4,573,477, Cl. 128-663.000.
Naoi, Mitsuaki: *See*—
Kato, Yoshitake; and Naoi, Mitsuaki, 4,573,572, Cl. 206-303.000.
Nash, Franklin R.: *See*—
Gordon, Eugene I.; Hartman, Robert L.; and Nash, Franklin R., 4,573,255, Cl. 29-574.000.
Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Piercer. 4,573,834, Cl. 408-16.000.
National Distillers and Chemical Corporation: *See*—
Kinsman, Donald V.; and Luken, Clement H., Jr., 4,574,053, Cl. 252-134.000.
NEC Corporation: *See*—
Fujii, Shuzo; Shimada, Yuzo; Utsumi, Kazuaki; and Saito, Yutaka, 4,574,255, Cl. 331-25.000.
Kobayashi, Kazutomo, 4,574,378, Cl. 370-104.000.
Orikasa, Hiromi, 4,574,164, Cl. 179-2.0EB.
Yoshida, Yasuharu, 4,574,246, Cl. 329-124.000.
Nellis, Walter E.: *See*—
Gritters, Gregory A.; Nellis, Walter E.; and Featherstone, John L., 4,573,803, Cl. 366-167.000.
Netto, Daniel J. Human breast prosthesis. 4,573,999, Cl. 623-7.000.
Network Medical Containers Pty, Ltd.: *See*—
Galloway, Howard R.; and Shanks, Gary, 4,573,581, Cl. 206-570.000.
Netzov, Nikola M.: *See*—
Petkov, Georgi K.; Netzov, Nikola M.; Botev, Botyo P.; and Bankovski, Dimiter N., 4,573,841, Cl. 409-244.000.
Neugebauer, Constantine A.: *See*—
Glascock, Homer H., II; Neugebauer, Constantine A.; and Webster, Harold F., 4,574,299, Cl. 357-81.000.
Neville Chemical Company: *See*—
Kaza, Michael D.; and Sauers, Paul S., 4,574,057, Cl. 260-101.000.
Newman, Patricia T. Means and method of showing feelings. 4,573,927, Cl. 434-236.000.
Newman-Tonks Engineering Limited: *See*—
Phillips, Douglas C., 4,573,238, Cl. 16-79.000.
Nicolai, J. Steven. Failsafe security lock. 4,573,720, Cl. 292-144.000.
Niedecker, Herbert. Hanger loop assembly. 4,573,241, Cl. 17-44.200.
Niemann, Gary O. Fruit sizer. 4,573,583, Cl. 209-663.000.
Nillesen, Antonius H. H. J., to U.S. Philips Corporation. Line synchronizing circuit for a picture display device. 4,574,307, Cl. 358-158.000.
Nilsson, Karl-Ivar, to Klintland. Golf training device. 4,573,687, Cl. 273-184.00B.
Nimon, Susan K.: *See*—
Kochte, Werner W.; and Nimon, Susan K., 4,573,237, Cl. 15-344.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Suzuki, Norio, 4,573,389, Cl. 84-1.260.
Nippon Infrared Industries Co., Ltd.: *See*—
Sugiyama, Seiji; Suenaga, Norihiro; Suenaga, Nobuyuki; and Kaneda, Michihiro, 4,573,465, Cl. 128-303.100.
Nippon Kogaku K.K.: *See*—
Hashimoto, Takaaki; Motoori, Ryuzo; and Minagawa, Kazushi, 4,574,303, Cl. 358-29.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; Sato, Yukihiko; and Morishige, Eiji, 4,573,666, Cl. 266-80.000.
Nippon Mining Co., Ltd.: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Nippon Oil Company Limited: *See*—
Uemura, Seiichi; Hirose, Takao; Sohda, Yoshio; Sakamoto, Takayoshi; and Kishimoto, Yoshio, 4,574,077, Cl. 423-447.600.
Nippon Piston Ring Kabushiki Kaisha: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,573,891, Cl. 418-173.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Irie, Kazunari; Taka, Masahiro; and Murakami, Hideyo, 4,574,383, Cl. 375-27.000.
Nippondenso Co., Ltd.: *See*—
Matsumura, Toshimi; Miyaki, Masahiko; and Masuda, Akira, 4,573,442, Cl. 123-450.000.
Morita, Yoshiyuki; and Nakamura, Hiroshi, 4,573,723, Cl. 292-336.300.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,573,882, Cl. 417-366.000.
Nishikawa, Kenji: *See*—
Takahashi, Hirotake; and Nishikawa, Kenji, 4,573,698, Cl. 280-279.000.
Nishimura, Hiroyuki, to Omron Tateisi Electronics Co. Verifying system. 4,574,190, Cl. 235-449.000.
Nishimura, Izumi: *See*—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Nishio, Haruko, legal representative: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.
Nishio, Tsutomu, deceased: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.
Nishiyama, Yosuke, to Toyota Jidosha Kabushiki Kaisha. Apparatus for assembling front under portion of vehicle body. 4,573,626, Cl. 228-6.100.
Nishizaki, Genichi: *See*—
Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, 4,573,261, Cl. 29-701.000.
Nishizawa, Jun-ichi; and Tamamushi, Takashige, to Nishizawa, Jun-ichi. One-dimensional semiconductor imaging device. 4,574,310, Cl. 358-212.000.
Nissan Motor Co., Ltd.: *See*—
Eguchi, Shinsuke, 4,573,560, Cl. 192-87.100.
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Murasugi, Takashi; and Suzuki, Tadashi, 4,573,375, Cl. 74-863.000.
Katayama, Kaoru, 4,573,808, Cl. 384-114.000.
Takasaki, Masaru; and Aoyama, Masutoshi, 4,574,338, Cl. 362-278.000.
Nissan Shatai Company, Limited: *See*—
Goto, Shinji; Kingo, Takao; Ochi, Akira; and Yoshikawa, Yoshiro, 4,573,694, Cl. 280-5.00A.
Nitschke, Werner: *See*—
Kaiser, Gunther; and Nitschke, Werner, 4,574,265, Cl. 340-52.00R.
Nixon, Michael T. Acoustical panels. 4,574,099, Cl. 428-68.000.
Noble, David, to Glaxo Group Limited. Cephalosporin compounds. 4,574,152, Cl. 544-4.000.
Noble, Roger K.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,573,906, Cl. 431-202.000.
Noda, Yoichiro: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,574,192, Cl. 250-227.000.
Nogi, Hiroyoshi; and Tanaka, Shigeru, to Musashi Engineering Kabushiki Kaisha. Device for delivery of paper sheets for an apparatus for counting the number of paper sheets. 4,573,674, Cl. 271-118.000.
Nomura, Hirokazu; Sato, Yukihiko; and Morishige, Eiji, to Nippon Kokan Kabushiki Kaisha. Apparatus for quenching butt-welded portion of rail. 4,573,666, Cl. 266-80.000.
Nomura, Takao: *See*—
Ohyama, Toru; and Nomura, Takao, 4,574,201, Cl. 307-243.000.
Nonnenmacher, Ronald C.; and Tinder, David V., to United Technologies Automotive, Inc. Method and apparatus for measuring hysteresis of a position sensor. 4,573,341, Cl. 73-1.00D.
Noon, George P.; Feldman, Louis W.; and Peterson, Julia A., to Baylor College of Medicine. Disposable blood pump. 4,573,883, Cl. 417-394.000.
Nord, Philip J. Formative orthodontic appliance. 4,573,914, Cl. 433-18.000.
Nordberg, Anthony, to GQ Defence Equipment Limited. Target image presentation system. 4,573,924, Cl. 434-20.000.
Nordisk Ventilator Co. A/S: *See*—
Andersen, Steen H.; and Pedersen, Bendt O., 4,573,874, Cl. 416-157.00R.
Nordson Corporation: *See*—
Cobbs, Walter H., Jr.; and Rehman, William R., 4,573,429, Cl. 118-322.000.
Cobbs, Walter H., Jr.; Huddleston, Robert J.; and Guldner, Robert A., 4,574,005, Cl. 55-48.000.
North American Philips Consumer Electronics Corp.: *See*—
Bradley, Ralph H., 4,573,764, Cl. 350-128.000.

Northern Telecom Limited: *See—*
Brown, Michael, 4,574,272, Cl. 340-384.00R.
Kemp, Michael F.; and Champagne, Claude J., 4,574,375, Cl. 370-67.000.
Northwood, James E.: *See—*
Quested, Peter N.; and Northwood, James E., 4,573,516, Cl. 164-61.000.
Norton Christensen, Inc.: *See—*
Carroll, Jimmy L.; and Aumann, James T., 4,573,539, Cl. 175-58.000.
Norton, Michael A.: *See—*
Serratelli, John F.; and Norton, Michael A., 4,574,137, Cl. 524-724.000.
Nottingham, John, to Meritus Industries, Inc. Mounting structure for a crib toy. 4,573,654, Cl. 248-231.100.
Nowaczyk, Philip J., to Zenith Electronics Corporation. Variable rate horizontal deflection system for a video monitor. 4,574,224, Cl. 315-408.000.
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, to TMC Corporation. Release ski binding. 4,573,701, Cl. 280-616.000.
NSK-Warner K.K.: *See—*
Kawai, Osamu; Yamamoto, Kazuo; and Yokote, Yoshihiro, 4,573,709, Cl. 280-804.000.
Nubs Nob, Inc.: *See—*
Dilworth, James L.; and Brinks, Robert J., 4,573,636, Cl. 239-2.00S.
Nusonics, Inc.: *See—*
Zacharias, Ellis M., Jr., 4,573,346, Cl. 73-61.10R.
Nussbaum, Hans, to Hans Nussbaum. Lifting device, especially elevating platform for motor vehicles. 4,573,663, Cl. 254-89.00H.
Nye, Charles L., to Plessey Company plc, The. Coin runway with coin sequencing facility. 4,573,485, Cl. 133-3.00D.
Nypro Inc.: *See—*
Lankton, Gordon B.; and Paradis, Joseph R., 4,573,242, Cl. 24-16.0PB.
Oak Industries Inc.: *See—*
Denley, Ronald S., 4,574,171, Cl. 200-340.000.
Oakley, Nicholas R.: *See—*
Adams, John F. E.; Proffit, Philip J. G.; Oakley, Nicholas R.; and Folland, Rickworth, 4,573,597, Cl. 215-12.00R.
Oberlin, Claude: *See—*
Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, 4,573,628, Cl. 228-170.000.
Ochi, Akira: *See—*
Goto, Shinji; Kingo, Takao; Ochi, Akira; and Yoshikawa, Yoshiro, 4,573,694, Cl. 280-5.00A.
O'Connor, Martin F.: *See—*
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,573,875, Cl. 416-198.00A.
O'Connor, Robert F., to Amtrol Inc. Non-refillable valve. 4,573,611, Cl. 222-147.000.
Offenhauer, Robert D.: *See—*
Audeh, Costandi A.; and Offenhauer, Robert D., 4,573,530, Cl. 166-260.000.
Ogawa, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Rectifier circuit with attack time variable in response to an input signal level. 4,574,202, Cl. 307-261.000.
Ogawa, Iwakichi, to Takara Co. Ltd. Motor vehicle with elongation means and movable exhaust. 4,573,942, Cl. 446-457.000.
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, to Sumitomo Electric Industries, Ltd.; and Sharp Kabushiki Kaisha. Release agent applicator for use with copying machine. 4,573,428, Cl. 118-60.000.
Ogura, Masami: *See—*
Shimizu, Yasuo; and Ogura, Masami, 4,573,373, Cl. 74-468.000.
Oguri, Yasuo; Awata, Mitsuru; and Ariyama, Noriyuki, to Mitsubishi Chemical Industries Ltd. Calcium silicate shaped product. 4,574,012, Cl. 106-120.000.
Ohashi, Makoto: *See—*
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Ohkubo, Noriaki: *See—*
Uetuji, Toshio; and Ohkubo, Noriaki, 4,573,879, Cl. 417-312.000.
Ohkura, Hideaki: *See—*
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Ohmi, Shohei: *See—*
Omi, Takashi; and Ohmi, Shohei, 4,573,838, Cl. 408-204.000.
Ohmori, Takashi: *See—*
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,574,281, Cl. 340-783.000.
Ohnishi, Akito: *See—*
Watanabe, Haruo; Nakano, Kazuo; and Ohnishi, Akito, 4,573,443, Cl. 123-492.000.
Ohnishi, Hisaaki: *See—*
Amano, Itaru; Maikuma, Yoshimata; Ozaki, Keiji; and Ohnishi, Hisaaki, 4,573,859, Cl. 414-628.000.
Ohnishi, Kenichi, to Toyota Jidosha Kabushiki Kaisha. Theft warning system. 4,574,268, Cl. 340-64.000.
Ohnishi, Shunsaku: *See—*
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,573,882, Cl. 417-366.000.
Ohno, Hideaki: *See—*
Asada, Takafumi; Yoshida, Churyo; Koda, Minoru; and Ohno, Hideaki, 4,573,807, Cl. 384-100.000.
Ohno, Makoto; Kobayashi, Hisao; and Kato, Kimio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable-delivery compressor. 4,573,878, Cl. 417-270.000.
Ohsaki Eisei Zairyo K.K.: *See—*
Ohsaki, Hiroaki, 4,573,990, Cl. 604-385.00R.
Ohsaki, Hiroaki, to Ohsaki Eisei Zairyo K.K. Disposable diapers. 4,573,990, Cl. 604-385.00R.
Ohtsuki, Osamu: *See—*
Tanikawa, Kunihiro; and Ohtsuki, Osamu, 4,574,295, Cl. 357-24.000.
Ohyama, Toru; and Nomura, Takao, to Alps Electric Co., Ltd. Radio frequency switching circuit device. 4,574,201, Cl. 307-243.000.
Oikawa, Toshiyuki: *See—*
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Okada, Chozo. Braille print board. 4,573,926, Cl. 434-115.000.
Okada, Kazuo, to Kabushiki Kaisha Universal. Slot machine with random number generation. 4,573,681, Cl. 273-143.00R.
Okada, Yasuyuki: *See—*
Tabata, Kuniaki; Tsuhara, Susumu; Machida, Tetsuo; Iwami, Hidefumi; and Okada, Yasuyuki, 4,574,364, Cl. 364-900.000.
Okamoto, Hidemasa; Yamanaka, Mitsuo; and Fujii, Kazuyoshi, to Ube Industries, Ltd. Triazine addition compounds. 4,574,154, Cl. 544-192.000.
Okaya, Takuji: *See—*
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,574,139, Cl. 525-61.000.
Okumoto, Tadaoki: *See—*
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, 4,573,693, Cl. 277-212.0FB.
Olek, David J., to TII Computer Systems, Inc. Method and apparatus for configurable line testing. 4,574,167, Cl. 179-175.30R.
Olesen, Paul; Lensky, Albert; and Pendzich, Richard J., to Swingline Inc. Staple forming and driving machine. 4,573,625, Cl. 227-131.000.
Olin Corporation: *See—*
Rickly, Jack D.; and Pennington, B. Timothy, 4,574,075, Cl. 423-184.000.
Smith, Warren F.; Shapiro, Eugene; and Winter, Joseph, 4,573,253, Cl. 29-460.000.
Oliphant, Larry J., to Harnischfeger Corporation. Means to reduce oscillatory deflection of vehicle. 4,573,592, Cl. 212-182.000.
Olivella, Roger: *See—*
Cantin, Michel; Jaussaud, Pierre; and Olivella, Roger, 4,573,414, Cl. 104-202.000.
Olympus Optical Co., Ltd.: *See—*
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, 4,574,309, Cl. 358-212.000.
Endo, Itaru; and Inoue, Yasuo, 4,573,772, Cl. 350-526.000.
Kanayama, Katsumi, 4,574,321, Cl. 360-74.100.
Mizuno, Shinichi, 4,573,770, Cl. 350-454.000.
Takemura, Haruhiko; Kato, Kiichi; and Sakamoto, Masaharu, 4,574,371, Cl. 369-100.000.
Omaki, Takanobu: *See—*
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,573,786, Cl. 354-416.000.
O'Mary, Bob L.: *See—*
Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,573,489, Cl. 137-59.000.
Omata, Tadao: *See—*
Miyamoto, Hiroshi; and Omata, Tadao, 4,573,676, Cl. 271-179.000.
Omi Kogyo Co., Ltd.: *See—*
Omi, Takashi; and Ohmi, Shohei, 4,573,838, Cl. 408-204.000.
Omi, Takashi; and Ohmi, Shohei, to Omi Kogyo Co., Ltd. Hole cutter. 4,573,838, Cl. 408-204.000.
Omron Tateisi Electronics Co.: *See—*
Nishimura, Hiroyuki, 4,574,190, Cl. 235-449.000.
Ono, Hitoshi: *See—*
Mori, Shosuke; Awaga, Makoto; Fujisaku, Kiminori; Yamauchi, Mitsuru; and Ono, Hitoshi, 4,574,347, Cl. 364-200.000.
Ontex PVBA: *See—*
VanMalderen, G. P., 4,574,024, Cl. 156-202.000.
Ooi, Shiro, to Rohm Company Limited. Encapsulated semiconductor with terminals having tabs to increase solder wetting. 4,574,297, Cl. 357-68.000.
Oono, Yoshihiro: *See—*
Asano, Makoto; Hasegawa, Kiyoharu; Tamura, Yukio; and Oono, Yoshihiro, 4,574,110, Cl. 428-402.210.
Opitz, Hans-Georg: *See—*
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.
Optical Systems International Inc.: *See—*
Frieder, Philip M.; and deRojas, Edward, 4,573,776, Cl. 351-167.000.
Optimetrix Corporation: *See—*
Phillips, Edward H., 4,573,791, Cl. 355-77.000.

ORC Manufacturing Co., Ltd.: *See*—
Miyamoto, Hiroshi; and Omata, Tadao, 4,573,676, Cl. 271-179.000.
Orchard, Melvin C.; and Rogers, Michael, to Joint Lock Corporation, The. Security lock. 4,573,721, Cl. 292-145.000.
Orikasa, Hiromi, to NEC Corporation. Ringing signal transmission system for radiotelephone system. 4,574,164, Cl. 179-2.0EB.
Orlite Engineering Ltd.: *See*—
Frimer, Itzchak, 4,574,335, Cl. 362-84.000.
Orphall, Axel W.; and Albers, Bernd G., to A & O Engineering, Inc. Impact crushers. 4,573,643, Cl. 241-189.00R.
Oshima, Hideharu: *See*—
Sato, Susumu; and Oshima, Hideharu, 4,573,780, Cl. 354-195.120.
Oswald, Thomas L.: *See*—
Wolf, Alby H.; and Oswald, Thomas L., 4,573,514, Cl. 164-4.100.
Otema, Martin. Security device. 4,573,584, Cl. 211-4.000.
Oushiden, Hideshi: *See*—
Sanbayashi, Takeshi; and Oushiden, Hideshi, 4,573,787, Cl. 355-14.00E.
Outboard Marine Corporation: *See*—
DuBois, Chester G., 4,573,932, Cl. 440-88.000.
Wick, Gerald H., 4,573,307, Cl. 56-11.800.
Owen, Donald W. Magnetic amplifier apparatus for balancing or limiting voltages or currents. 4,574,231, Cl. 323-253.000.
Owens, Charles A. Air cooled horizontal power piston engine. 4,573,436, Cl. 123-41.180.
Owens-Illinois, Inc.: *See*—
Fillmore, William E., 4,573,599, Cl. 215-225.000.
Fosnaught, Harold R., 4,574,020, Cl. 156-80.000.
Kusz, Maximillian, 4,573,582, Cl. 206-807.000.
Perry, Robert A., 4,573,598, Cl. 215-204.000.
Welker, Mathias P., 4,574,009, Cl. 65-158.000.
Oy Fiskars AB: *See*—
Call, Daniel D., 4,573,268, Cl. 30-161.000.
Oy Noki AB: *See*—
Ahola, Reijo, 4,574,373, Cl. 370-58.000.
Oy Partek AB: *See*—
Paakkinen, Ilmari, 4,574,064, Cl. 264-70.000.
Ozaki, Keiji: *See*—
Amano, Itaru; Maikuma, Yoshimata; Ozaki, Keiji; and Ohnishi, Hisaaki, 4,573,859, Cl. 414-628.000.
Ozaki, Ryoji: *See*—
Abe, Ken-ichi; and Ozaki, Ryoji, 4,574,170, Cl. 200-153.00G.
Ozawa, Seiji, to Ricoh, Ltd. Toner vessel for copying machine. 4,573,614, Cl. 222-542.000.
Ozen Corporation: *See*—
Koike, Eishi, 4,574,370, Cl. 369-65.000.
Ozone, Toshio: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,574,016, Cl. 148-144.000.
P. A. Rentrop, Hubbert & Wagner Fahrzeugausstatungen GmbH & Co. KG: *See*—
Schottker, Willi, 4,573,739, Cl. 297-362.000.
P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,574,100, Cl. 428-134.000.
Paakkinen, Ilmari, to Oy Partek AB. Method for continuous casting of objects out of a high-viscosity casting mix. 4,574,064, Cl. 264-70.000.
Pabst, Rudolf D. Composite lightweight non-metallic vehicle frame. 4,573,707, Cl. 280-792.000.
Pacific Scientific Company: *See*—
Pershall, Arthur A.; and Holling, George H., 4,574,225, Cl. 318-254.000.
Packaging Industries, Inc.: *See*—
Tricca, Raymond A.; and Foster, John K., 4,574,101, Cl. 428-138.000.
Packard, Thomas N., to Pass & Seymour, Inc. Ground fault circuit interrupter. 4,574,324, Cl. 361-46.000.
Padley & Venables Limited: *See*—
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., 4,573,744, Cl. 299-81.000.
Padmanathan, Thurairajah, to American Cyanamid Company. Process for preparing 2-hydrazino-1,3-diazacycloalk-2-ene hydrohalides. 4,574,155, Cl. 544-330.000.
Palitex Project-Company GmbH: *See*—
Lorenz, Rainer, 4,573,314, Cl. 57-296.000.
Palmieri, Joseph M.: *See*—
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,573,259, Cl. 29-602.00R.
Palmquist, Steven R.: *See*—
Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., 4,574,354, Cl. 364-481.000.
Paluka, Charles F.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,573,806, Cl. 374-144.000.
Pamler, Gerhard, to Triumph-Adler A.G. fur Buro- und Informationstechnik. Elastic bearings for shafts. 4,573,816, Cl. 400-661.000.
Pankow, Arnold A. Portable golf car. 4,573,549, Cl. 180-216.000.
Paoletti, Jean-Claude, to Laboratories Merck Sharp & Dohme - Chibret. Two-bottle assembly for preparing and dispensing a solution. 4,573,506, Cl. 141-98.000.
Paper, Inc.: *See*—
Clar, Milton; and Booth, Barclay, 4,573,409, Cl. 101-426.000.
Papesh, Thomas S. Frame to hold auto bodies for straightening. 4,573,337, Cl. 72-305.000.
Papst-Motoren GmbH & Co. KG: *See*—
Muller, Rolf; and Wurdak, Reinhold, 4,574,211, Cl. 310-68.00R.
Paradis, Joseph R.: *See*—
Lankton, Gordon B.; and Paradis, Joseph R., 4,573,242, Cl. 24-16.0PB.
Park, Owen H., to Heartland Industries, Inc. Building structure. 4,573,293, Cl. 52-92.000.
Parker, Dolores V. Storage and display case. 4,573,569, Cl. 206-1.700.
Parker, Harry L.: *See*—
Pastor, Jose ; Parker, Harry L.; and Wilson, David H., 4,574,357, Cl. 364-518.000.
Parker, Kenneth B., to IVAC Corporation. Infusion and blood chemistry monitoring system. 4,573,968, Cl. 604-67.000.
Parks, Thomas J. Toe lifting shoe. 4,573,457, Cl. 128-80.00E.
Parlex Corporation: *See*—
Rich, Donald S., 4,573,752, Cl. 339-17.00F.
Parratt, Noel J.: *See*—
Booth, Stuart E.; Clifford, Andrew W.; and Parratt, Noel J., 4,573,517, Cl. 164-61.000.
Pass & Seymour, Inc.: *See*—
Packard, Thomas N., 4,574,324, Cl. 361-46.000.
Pastoor, Jacobus: *See*—
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., 4,573,330, Cl. 62-476.000.
Pastor, Jose ; Parker, Harry L.; and Wilson, David H., to Pitney Bowes Inc. Real time character thinning system. 4,574,357, Cl. 364-518.000.
Pater, Larry L.; and Briggs, Aubrey C., to Dravo Corporation. Accelerating slugs of liquid. 4,573,637, Cl. 239-11.000.
Patterson, Roger L., to Macdon Industries Ltd. Pull-type windrower. 4,573,309, Cl. 56-228.000.
Paukovits, Edward J., Jr.: *See*—
Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,573,262, Cl. 29-739.000.
Paulonis, Daniel F.: *See*—
Genereux, Paul D.; and Paulonis, Daniel F., 4,574,015, Cl. 148-11.50N.
Paulucci, Jeno F. Process of making a dough crust. 4,574,090, Cl. 426-439.000.
Payne, Francis L.: *See*—
Cohen, Marvin M.; and Payne, Francis L., 4,574,330, Cl. 361-388.000.
Peacock, Roy N., to HPS Corporation. Toggle clamp. 4,573,717, Cl. 285-365.000.
Peddinghaus, Rolf. Equipment for disentangling bars. 4,573,860, Cl. 414-745.000.
Pedersen, Bendt O.: *See*—
Andersen, Steen H.; and Pedersen, Bendt O., 4,573,874, Cl. 416-157.00R.
Peloggio, Alessandro, to Exacta S.p.A. Device for threading knit articles onto the pin holder ring of a linking machine. 4,573,419, Cl. 112-27.000.
Penanhoat, Jean-Francois: *See*—
Favrel, Michel; and Penanhoat, Jean-Francois, 4,573,286, Cl. 49-214.000.
Pendergrass, Edward A., to General Electric Company. Incandescent lamp and base. 4,574,217, Cl. 313-579.000.
Pendzich, Richard J.: *See*—
Olesen, Paul; Lensky, Albert; and Pendzich, Richard J., 4,573,625, Cl. 227-131.000.
Penner, Wayne A.: *See*—
Peterson, Robert D.; and Penner, Wayne A., 4,574,358, Cl. 364-550.000.
Pennington, B. Timothy: *See*—
Rickly, Jack D.; and Pennington, B. Timothy, 4,574,075, Cl. 423-184.000.
PepsiCo Inc.: *See*—
Berger, Martin J.; and Apsell, Sheldon P., 4,573,954, Cl. 493-55.000.
Peraud, Jean-Claude: *See*—
Fournier, Pascal; and Peraud, Jean-Claude, 4,573,520, Cl. 164-253.000.
Perry, John D.; and Michael, David J., to Dresser Industries, Inc. Chrome-magnesite refractories and method of preparation. 4,574,119, Cl. 501-114.000.
Perry, Robert A., to Owens-Illinois, Inc. Child-resistant package with tamper indicating device. 4,573,598, Cl. 215-204.000.
Pershall, Arthur A.; and Holling, George H., to Pacific Scientific Company. Apparatus for accommodating inductive flyback in pulsed motor windings. 4,574,225, Cl. 318-254.000.
Personal Products Company: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,573,988, Cl. 604-379.000.
Pieniak, Heinz A.; and Mesek, Virginia R., 4,573,991, Cl. 604-385.00A.
Persson, Hans, to ASEA Aktiebolag. Hydraulic press with pressure cell. 4,573,335, Cl. 72-63.000.
Pescatore, Richard; and Boumendil, Jean-Jack, to Piezo-Ceram Electronique. Continuous furnace for soldering electronic components. 4,574,182, Cl. 219-388.000.
Peters, Jack R.: *See*—
Crossland, William A.; Peters, Jack R.; Ross, Peter W.; and Ayliffe, Peter J., 4,574,282, Cl. 340-784.000.
Petersen, Dirk, to Bran & Lubbe GmbH. Piston diaphragm pump. 4,573,885, Cl. 417-383.000.
Peterson, Julia A.: *See*—
Noon, George P.; Feldman, Louis W.; and Peterson, Julia A., 4,573,883, Cl. 417-394.000.
Peterson, Robert D.; and Penner, Wayne A., to Mobil Oil Corporation. Monitor display control. 4,574,358, Cl. 364-550.000.

Peterson, Robert L., to Galson Research Corporation. Method for decontaminating soil. 4,574,013, Cl. 134-2.000.

Petkov, Georgi K.; Netzov, Nikola M.; Botev, Botyo P.; and Bankovski, Dimiter N., to N P S P po Hydroplastichna Obrabotka na Metalite. Method of and apparatus for the finish shaping of profiled cylindrical holes. 4,573,841, Cl. 409-244.000.

Petrich, Dennis M.: *See—*
Kelly, Thomas C.; Wurscher, Robert J.; Petrich, Dennis M.; and Rideout, Earl H., 4,574,235, Cl. 324-158.00F.

Petty, Thomas J., to Motorola, Inc. Rapid turn-on voltage regulator. 4,574,232, Cl. 323-268.000.

Peyre, Henri: *See—*
Beyl, Jean; Bernard, Jean; le Faou, Daniel; and Peyre, Henri, 4,573,700, Cl. 280-605.000.

Pfaff Industriemaschinen GmbH: *See—*
Mall, Gunther; Dietrich, Herbert; and Stephan, Willi, 4,573,421, Cl. 112-146.000.

Pfister, Jorg; and Kuzmenko, Arnold, to Rhodia AG. Braking system for yarn beaming assemblies. 4,573,245, Cl. 28-187.000.

Phadke, Hemant: *See—*
Johnson, Carl N.; Phadke, Hemant; and Sieling, Roger L., 4,573,398, Cl. 92-101.000.

Phillips, Douglas C., to Newman-Tonks Engineering Limited. Door closer incorporating self-cleaning and temperature compensating flow control valve. 4,573,238, Cl. 16-79.000.

Phillips, Edward H., to Optimetrix Corporation. Step-and-repeat projection alignment and exposure system. 4,573,791, Cl. 355-77.000.

Phillips Petroleum Company: *See—*
Willcox, Kenneth W.; and Mills, Kenneth R., 4,574,134, Cl. 524-157.000.

Piazzola, Gaetano. System for hot extruding, drawing, and similarly processing plastomers or elastomers, incorporating a means of recovering and utilizing heated air from the cooling of heated parts. 4,573,897, Cl. 425-143.000.

Picotte, Ronald T., to St. Regis Corporation. Fluid driven tube positioner. 4,573,863, Cl. 414-763.000.

Pieniak, Heinz A.; and Iskra, Michael J., to Personal Products Company. Superthin absorbent product. 4,573,988, Cl. 604-379.000.

Pieniak, Heinz A.; and Mesek, Virginia R., to Personal Products Company. Gatherable laminated structure including an apertured elastic member. 4,573,991, Cl. 604-385.00A.

Pierce, William: *See—*
Wisman, Craig B.; Pierce, William; and Donachy, James H., 4,573,997, Cl. 623-3.000.

Pietro Laverda S.p.A.: *See—*
Raineri, Giuseppe, 4,573,483, Cl. 130-27.0AE.

Piezo-Ceram Electronique: *See—*
Pescatore, Richard; and Boumendil, Jean-Jack, 4,574,182, Cl. 219-388.000.

Pilcher, Henry D. Apparatus for dispensing tape having a protective backing. 4,574,030, Cl. 156-522.000.

Pilkington P.E. Limited: *See—*
Swift, David W., 4,573,759, Cl. 350-3.850.

Pilling Co.: *See—*
Kambin, Parviz, 4,573,448, Cl. 128-1.00R.

Pinneo, George G., to Sensormatic Electronics Corporation. Non-contact electrostatic deactivator. 4,574,274, Cl. 340-572.000.

Piovesan, Alessandro, to ATIC S.r.l. Mobile crusher unit for clearing rough terrain, preparing road formworks and roadbeds, operating open-works mines, and the like. 4,573,826, Cl. 404-90.000.

Pippert, Aaron J., to Utex Industries, Inc. Fishing lure. 4,573,283, Cl. 43-42.090.

Pirelli General plc: *See—*
Hillyard, Colin D., 4,573,251, Cl. 29-450.000.

Pischke, Reiner; and Kohler, Karl-Heinz, to Audi NSU Auto Union Aktiengeseilschaft. Method for limiting the speed of an internal combustion engine in a vehicle and device for same. 4,573,440, Cl. 123-333.000.

Pitel, Ira J., to HID Systems, Inc. Fast warmup ballast for HID lamps. 4,574,223, Cl. 315-307.000.

Pitner, Philip M.: *See—*
Lechaton, John S.; Pitner, Philip M.; and Srinivasan, Gurumakonda R., 4,573,256, Cl. 29-576.00B.

Pitney Bowes Inc.: *See—*
Coppola, Vincent G.; Lorenzo, John L.; Grisgraber, Edwin G.; and Manduley, Flavio M., 4,574,352, Cl. 364-466.000.
Pastor, Jose ; Parker, Harry L.; and Wilson, David H., 4,574,357, Cl. 364-518.000.

Pitsko, John J.: *See—*
Lasso, Eugene R.; and Pitsko, John J., 4,573,800, Cl. 366-101.000.

Pittner, Gregory A., to Arrowhead Industrial Water, Inc. Reverse osmosis system. 4,574,049, Cl. 210-639.000.

Plastipak Packaging, Inc.: *See—*
Slat, William A., 4,573,596, Cl. 215-12.00R.

Platinum Pen Co., Ltd.: *See—*
Kodera, Kimio, 4,573,818, Cl. 401-131.000.

Platinum Pen of America, Inc.: *See—*
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, 4,573,817, Cl. 401-65.000.

Plaza, Jaime P., to Majorica, S.A. Sliding hook device for clasping pearl or glass bead necklaces that have a free hanging end. 4,573,243, Cl. 24-116.00A.

Plessey Company plc, The: *See—*
Nye, Charles L., 4,573,485, Cl. 133-3.00D.

Pneumo Corporation: *See—*
Spurbeck, Kenneth C., 4,573,494, Cl. 137-331.000.

Poehler, Theodore O.: *See—*
Potember, Richard S.; Poehler, Theodore O.; and Benson, Richard C., 4,574,366, Cl. 365-153.000.

Poggio, Tomaso: *See—*
Resnikoff, Howard L.; Poggio, Tomaso; and Sims, Karl, 4,574,311, Cl. 358-213.000.

Polak, Anthony J.; Wrezel, James A.; and Beuhler, Allyson J., to Signal Companies, Inc., The. Electrochromic devices. 4,573,768, Cl. 350-357.000.

Pomonik, George M.; and Jansen, Martin B., to Amtel, Inc. Rapidly installable mooring and cargo transfer system. 4,573,425, Cl. 114-230.000.

Pont A Mousson S.A.: *See—*
Fournier, Pascal; and Peraud, Jean-Claude, 4,573,520, Cl. 164-253.000.

Ponticello, Gerald S.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,574,127, Cl. 514-365.000.

Poppenheimer, Charles B., to GTY Industries. Underwater lights. 4,574,337, Cl. 362-267.000.

Port, John H.; Kukoleck, Dennis G.; and Guezuraga, Robert M., to General Electric Company. Core for molybdenum alloy x-ray anode substrate. 4,574,388, Cl. 378-144.000.

Porter, Calvin R., Jr.: *See—*
Porter, Calvin R., Sr.; and Porter, Calvin R., Jr., 4,573,857, Cl. 414-563.000.

Porter, Calvin R., Sr.; and Porter, Calvin R., Jr., to Ready Built Tow Trucks, Inc. Vehicle towing mechanism. 4,573,857, Cl. 414-563.000.

Portz, William E.: *See—*
Ipema, Neal J.; and Portz, William E., 4,573,311, Cl. 56-400.170.

Possati, Mario: *See—*
Golinelli, Guido; and Possati, Mario, 4,573,272, Cl. 33-172.00E.

Potember, Richard S.; Poehler, Theodore O.; and Benson, Richard C., to Johns Hopkins University, The. Optical storage and switching devices using organic charge transfer salts. 4,574,366, Cl. 365-153.000.

Potter, Ralph M.: *See—*
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.

Potter, William D.; and Kiamil, Sinan B., to Smith & Nephew Associated Companies P.L.C. Polymerizable compounds. 4,574,130, Cl. 523-111.000.

Poveromo, George: *See—*
Poveromo, Melvin D., 4,573,923, Cl. 433-181.000.

Poveromo, March: *See—*
Poveromo, Melvin D., 4,573,923, Cl. 433-181.000.

Poveromo, Melanie: *See—*
Poveromo, Melvin D., 4,573,923, Cl. 433-181.000.

Poveromo, Melvin D., to Poveromo, George; Poveromo, March; and Poveromo, Melanie. Denture connector. 4,573,923, Cl. 433-181.000.

Powers, David E.: *See—*
Small, Marc J.; and Powers, David E., 4,573,513, Cl. 160-135.000.

Powis, William N.: *See—*
Albritton, Charles W.; Powis, William N.; and Graham, William M., 4,573,912, Cl. 432-222.000.

Prandina, Aldo F., to Ing. Loro Piana & C. S.p.A. Blanket assembly composed of at least two interconnectable blankets, for single and double beds. 4,573,227, Cl. 5-486.000.

Prater, Johnny L.: *See—*
Laten, Bobby W.; and Prater, Johnny L., 4,573,647, Cl. 244-3.120.

Prendergast, Ian D., to Allied Corporation. Apparatus and method for removing inclusions. 4,573,664, Cl. 266-44.000.

Prinoth, Erich. Track for motor vehicle having two parallel half-tracks. 4,573,746, Cl. 305-35.0EB.

Procter & Gamble Company, The: *See—*
Minetola, James A.; and Tucker, David R., 4,573,986, Cl. 604-366.000.

Production Design Products, Inc.: *See—*
Brown, Robert W., 4,573,644, Cl. 242-67.10R.

Proengin S.A.: *See—*
Clausin, Pierre, 4,573,424, Cl. 114-106.000.

Proffit, Philip J. G.: *See—*
Adams, John F. E.; Proffit, Philip J. G.; Oakley, Nicholas R.; and Folland, Rickworth, 4,573,597, Cl. 215-12.00R.

Progressive Fastening, Inc.: *See—*
Richards, Peter S., 4,573,652, Cl. 248-74.100.

Prototypes, Ltd.: *See—*
Dyson, James, 4,573,236, Cl. 15-333.000.

Provin, Robert R.: *See—*
Yearout, James D.; Provin, Robert R.; and Browne, John S., 4,574,007, Cl. 62-42.000.

Pryor, Timothy R., to Diffracto Ltd. Sensing location of an object. 4,574,199, Cl. 250-561.000.

PTX-Pentronix, Inc.: *See—*
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,573,895, Cl. 425-78.000.

Puffer, Herbert J., Jr.: *See—*
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,573,895, Cl. 425-78.000.

Pujols, Guy: *See—*
Josse, Jean-Jacques; Pujols, Guy; and Di Vincenzo, Serge, 4,573,541, Cl. 175-78.000.

Pulliam, Mary H.: *See—*
Carville, Donna B.; Feig, Edwin R.; Rose, Gene D ; and Pulliam, Mary H., 4,573,488, Cl. 137-13.000.

Pullman Standard: *See—*
Hesch, Harold E.; and McNally, George S., 4,573,843, Cl. 410-58.000.

Pullman Standard, Inc.: *See—*
Kunst, Robert J.; Lahey, Gerald F.; and Wille, Herbert S., 4,573,594, Cl. 213-51.000.

Pyke, Stephen C.; and Bruce, Mark R., to Standard Oil Company (Ohio), The. Photocorrosion resistant semiconductor photoelectrodes. 4,574,039, Cl. 204-290.00R.

Quattlebaum, W. Gregg: *See—*
Thrash, Tommy K.; Tock, Richard W.; Cox, Lyle V.; and Quattlebaum, W. Gregg, 4,573,447, Cl. 126-263.000.

Queen, Charles L. Steering mechanisms for outboard motor. 4,573,930, Cl. 440-56.000.

Quested, Peter N.; and Northwood, James E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method of and apparatus for casting directionally solidified articles. 4,573,516, Cl. 164-61.000.

Quester, Horst: *See—*
Ruffer, Alfred; Maubach, Peter; Haas, Johannes; and Quester, Horst, 4,573,484, Cl. 131-327.000.

Quill, Gary J.: *See—*
Egan, Michael J.; and Quill, Gary J., 4,573,876, Cl. 416-213.00R.

Rabindran, K. George: *See—*
Svyatsky, Eduard; Rabindran, K. George; and Faber, Thomas J., 4,573,675, Cl. 271-122.000.

Racca, William H.; Bolvin, Michael A.; and Bilezerian, Mel E., to Racca, William H.; and Bolvin, Michael A. Thermistor temperature control circuit. 4,574,200, Cl. 307-117.000.

Radford, Leonard: *See—*
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., 4,573,744, Cl. 299-81.000.

Rado, George T.; Vittoria, Carmine; and Ferrari, James M., to United States of America, Navy. High switching speed electrically tuned microwave magnetic resonance devices. 4,574,259, Cl. 333-157.000.

Ragen Data Systems, Inc.: *See—*
Apelman, Steven P., 4,574,278, Cl. 340-722.000.

Raineri, Giuseppe, to Pietro Laverda S.p.A. Combine harvesters. 4,573,483, Cl. 130-27.0AE.

Rajala, Gregory J.: *See—*
Kloehn, Kurt J.; Rajala, Gregory J.; and Abel, Kent W., 4,573,382, Cl. 83-53.000.

Rajaram, Babu: *See—*
Krause, Charles A.; and Rajaram, Babu, 4,574,277, Cl. 340-703.000.

Ramey, Edwin O., to Atlas Metal Industries, Inc. Stand with spring lock legs. 4,573,415, Cl. 108-129.000.

Ranco Incorporated: *See—*
Johnson, Carl N.; Phadke, Hemant; and Sieling, Roger L., 4,573,398, Cl. 92-101.000.
White, Lee A., 4,573,497, Cl. 137-625.290.

Ranjan, Raj: *See—*
Krutchen, Charles M.; Ranjan, Raj; and Yang, Jan-Chin, 4,573,345, Cl. 73-56.000.

Rasmussen, Harvey E.: *See—*
Tesch, Sylvester M., Jr., 4,573,609, Cl. 221-211.000.

Rasmussen, Harvey J.: *See—*
Tesch, Sylvester M., Jr., 4,573,609, Cl. 221-211.000.

Rasmussen, Patricia: *See—*
Tesch, Sylvester M., Jr., 4,573,609, Cl. 221-211.000.

Raychem Corp.: *See—*
Arrington, John P.; Jaraczewski, Kathleen A.; Moisson, Marc F.; and Wisecarver, Martin L., 4,573,607, Cl. 221-25.000.
Edwards, Neil A.; Holmes, James C.; and Wales, Denis L., 4,574,023, Cl. 156-187.000.
Midgley, John A.; and Hulett, Richard H., 4,574,188, Cl. 219-549.000.

RCA Corporation: *See—*
Battson, Donald F., 4,574,313, Cl. 358-213.000.
Strouse, Douglas A., 4,573,934, Cl. 445-3.000.
van Raalte, John A., 4,574,306, Cl. 358-107.000.
Wardell, Myron H., Jr., 4,573,935, Cl. 445-66.000.

Ready Built Tow Trucks, Inc.: *See—*
Porter, Calvin R., Sr.; and Porter, Calvin R., Jr., 4,573,857, Cl. 414-563.000.

Rechtschaffen, Rudolph N., to International Business Machines Corp. Apparatus for addressing a larger number of instruction addressable central processor registers than can be identified by a program instruction. 4,574,349, Cl. 364-200.000.

Record Industrial Company: *See—*
Lipschutz, James N., 4,574,368, Cl. 367-108.000.

Reed, Clifford C. Protective hood for firefighters. 4,573,217, Cl. 2-7.000.

Reed, Martin A.: *See—*
Carlgren, Richard G.; Reed, Martin A.; and Rosenbaum, Walter S., 4,574,363, Cl. 364-900.000.

Reeves, Michael. Disposable straw, lid and cup combination. 4,573,631, Cl. 229-7.00S.

Regie Nationale des Usines Renault: *See—*
Bascou, Jacques, 4,574,285, Cl. 340-825.690.

Rehman, William R.: *See—*
Cobbs, Walter H., Jr.; and Rehman, William R., 4,573,429, Cl. 118-322.000.

Reilly, David M., to Medrad, Inc. Angiographic syringe and connector for joining a catheter thereto. 4,573,978, Cl. 604-240.000.

Reiney, Michael G.: *See—*
Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., 4,574,354, Cl. 364-481.000.

Reinhardt, Paul A., to Aker Oil Tools, Inc. High flow injection anchor. 4,573,529, Cl. 166-68.000.

Reiss, Ruediger, to Siemens Aktiengesellschaft. Arrangement for the transmission of speech according to the channel vocoder principle. 4,574,392, Cl. 381-51.000.

Renger, Larry H.: *See—*
Crow, Granville; Renger, Larry H.; and Sweet, Roger H., 4,573,944, Cl. 446-465.000.

Repa Feinstanswerk GmbH: *See—*
Fohl, Artur, 4,573,322, Cl. 60-638.000.

Reponty, Andre , to Harris-Marinoni S.A. Automatic setting device for slowing down a signature prior to folding in printing press chopper folders. 4,573,671, Cl. 270-20.100.

Research Corporation: *See—*
Wisman, Craig B.; Pierce, William; and Donachy, James H., 4,573,997, Cl. 623-3.000.

Resnikoff, Howard L.; Poggio, Tomaso; and Sims, Karl, to Thinking Machines Corporation. Random array sensing devices. 4,574,311, Cl. 358-213.000.

Restroom Facilities Corporation: *See—*
Kaufman, Charles E.; Shetler, Marvin R.; and Sharp, William M., 4,573,292, Cl. 52-79.100.

Reutlinger, Wolf-Dieter. Device for the determination of the unbalance of propellers. 4,573,355, Cl. 73-455.000.

Revlon, Inc.: *See—*
Tietjen, Marlene; Hollenberg, Jane; and Rigg, Richard T., 4,574,082, Cl. 424-63.000.

Rheeder, Frederik R. L.; and Dixon, Deon, to Trailmor [Proprietary] Limited. Trolley locking device. 4,573,564, Cl. 194-250.000.

Rhodia AG: *See—*
Pfister, Jorg; and Kuzmenko, Arnold, 4,573,245, Cl. 28-187.000.

Rich, Alan H.; Gaasterland, Douglas E.; and Tedder, Thomas E., to United States of America, Health and Human Services. Optical coupling device for biomicroscope. 4,573,467, Cl. 128-303.100.

Rich, Donald S., to Parlex Corporation. Flat cable connection system. 4,573,752, Cl. 339-17.00F.

Richard, Dennis J., to General Motors Corporation. Hydraulic power steering gear and rotary valve therefor. 4,573,496, Cl. 137-625.210.

Richards, Peter S., to Progressive Fastening, Inc. Support system for maritime or other use. 4,573,652, Cl. 248-74.100.

Richardson, Raymond H.; and Valley, Robert T., to International Business Machines Corporation. Chip decelerator. 4,573,830, Cl. 406-84.000.

Richardson-Vicks Inc.: *See—*
Gupte, Anil J.; and Kendall, Joyce M., 4,574,052, Cl. 252-90.000.

Rickly, Jack D.; and Pennington, B. Timothy, to Olin Corporation. Purification of alkali metal nitrates. 4,574,075, Cl. 423-184.000.

Ricks, Walter G.: *See—*
Hurley, Byron H.; and Ricks, Walter G., 4,573,502, Cl. 141-1.000.

Ricoh Co., Ltd.: *See—*
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,574,369, Cl. 369-44.000.

Ricoh, Ltd: *See—*
Ozawa, Seiji, 4,573,614, Cl. 222-542.000.

Rideout, Earl H.: *See—*
Kelly, Thomas C.; Wurscher, Robert J.; Petrich, Dennis M.; and Rideout, Earl H., 4,574,235, Cl. 324-158.00F.

Riedweg, Robert: *See—*
Schlensog, Klaus; Beer, Christian; and Riedweg, Robert, 4,573,969, Cl. 604-74.000.

Ries, Donald G., to Nalco Chemical Company. Alkoxy aryl sulfonate surfactants. 4,574,061, Cl. 260-512.00C.

Rife, Jack C.: *See—*
Lucas, Amand A.; Rife, Jack C.; and Donnelly, Stephen E., 4,574,198, Cl. 250-493.100.

Rigg, Richard T.: *See—*
Tietjen, Marlene; Hollenberg, Jane; and Rigg, Richard T., 4,574,082, Cl. 424-63.000.

Riley, Alfred T.; and Lord, Barry. Puzzles. 4,573,684, Cl. 273-157.00R.

Rinfret, Elizabeth M.: *See—*
Rinfret, John H. T.; and Rinfret, Elizabeth M., 4,573,852, Cl. 414-412.000.

Rinfret, John H. T.; and Rinfret, Elizabeth M. Vial rupturing apparatus. 4,573,852, Cl. 414-412.000.

Ringley, Michael B., to Westvaco Corporation. Process for delignification of lignocellulosic material in the presence of anthraquinone in solution with white and black liquors. 4,574,032, Cl. 162-38.000.

Riolo, Angelo V.: *See—*
Musto, Joseph A.; Scarella, Robert A.; Jacquett, Harold W.; Riolo, Angelo V.; and Della Fave, Nicholas I., 4,574,089, Cl. 426-386.000.

Ripoll, Javier G., to Stronghold International AG. Hydraulic jack for stressing elongate elements. 4,573,662, Cl. 254-29.00A.

Ritsema, Irving R., to Allied Corporation. Disc brake with caliper stabilizing tie-bar. 4,573,554, Cl. 188-73.380.

Robbins, Edward J.: *See—*
Daniel, Vernon T.; Johnson, James R.; and Robbins, Edward J., 4,573,353, Cl. 73-198.000.

Robert Bosch GmbH: *See—*
Hachtel, Hansjorg; and Dobler, Klaus, 4,574,237, Cl. 324-173.000.
Kaiser, Gunther; and Nitschke, Werner, 4,574,265, Cl. 340-52.00R.

Roberts, Arthur S., Jr.: *See—*
Lewis, Kermit E.; and Roberts, Arthur S., Jr., 4,573,606, Cl. 221-2.000.

Roberts, Kenneth B., to Compaq Computer Corporation. Video display system having multiple selectable screen formats. 4,574,279, Cl. 340-731.000.

Robotic Vision Systems, Inc.: *See—*
Hecker, Joel; Stern, Howard; and Heydenburg, Thomas, 4,573,758, Cl. 350-3.710.

Robustelli, Albert G.: *See—*
Ryles, Roderick G.; and Robustelli, Albert G., 4,573,533, Cl. 166-275.000.

Rockwell International Corporation: *See—*
Brissette, Ronald N., 4,573,946, Cl. 464-133.000.
Head, Manley J., 4,574,244, Cl. 329-50.000.
Huffman, Charles E.; and Foust, Jeffrey L., 4,574,385, Cl. 377-107.000.
Mickelson, Wilmer A., 4,574,245, Cl. 329-110.000.
Runyan, Wesley G., 4,574,342, Cl. 363-134.000.
Snodgrass, Kirk A., 4,574,248, Cl. 330-2.000.
Styers, C. James, 4,573,925, Cl. 434-49.000.

Rodi, Anton: *See—*
Blasius, Udo; May, Karl-Heinz; and Rodi, Anton, 4,573,410, Cl. 101-365.000.

Rodriguez, George H.: *See—*
Crews, James E.; and Rodriguez, George H., 4,574,187, Cl. 219-541.000.

Roelofs, Johannus C. M.: *See—*
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., 4,573,330, Cl. 62-476.000.

Rogers, Jimmy H. Self molding fiberglas. 4,574,106, Cl. 428-236.000.

Rogers, Michael: *See—*
Orchard, Melvin C.; and Rogers, Michael, 4,573,721, Cl. 292-145.000.

Rohm Company Limited: *See—*
Ooi, Shiro, 4,574,297, Cl. 357-68.000.

Rohm and Haas Company: *See—*
Gray, Richard T., 4,574,113, Cl. 429-194.000.

Rolland, Guy: *See—*
Boudet, Jean; and Rolland, Guy, 4,573,903, Cl. 425-555.000.

Rolls-Royce Limited: *See—*
Hand, Derek G., 4,573,867, Cl. 415-134.000.

Rolscreen Company: *See—*
Hagemeyer, Bruce A.; and Minter, Mearl J., 4,573,287, Cl. 49-381.000.

Roman, Horst L., to Cross Company, The. Dual stroke transfer drive. 4,573,566, Cl. 198-461.000.

Romer, Bendt W., to Danfoss A/S. Refrigeration compressor having a tubular insert of thermally insulating material in suction passage. 4,573,881, Cl. 417-312.000.

Rooney, Timothy M.: *See—*
Smith, William T.; Rooney, Timothy M.; and Watts, George T., 4,573,509, Cl. 152-158.000.

Rosaen, Borje O. Filtering device. 4,574,047, Cl. 210-130.000.

Rose, Gene D.: *See—*
Carville, Donna B.; Feig, Edwin R.; Rose, Gene D.; and Pulliam, Mary H., 4,573,488, Cl. 137-13.000.

Rosenbaum, Walter S.: *See—*
Carlgren, Richard G.; Reed, Martin A.; and Rosenbaum, Walter S., 4,574,363, Cl. 364-900.000.

Rosenmeier, Gordon: *See—*
DuFrene, Clement O., 4,573,892, Cl. 418-219.000.

Rosenstrom, Pertti, to Erkomat Oy. Equipment for the removal of air out of pulverulent materials. 4,573,504, Cl. 141-59.000.

Rosiek, Jozef; Spruce, Frank; and Atkinson, Brian, to Valor Newhome Limited. Gas fires. 4,573,446, Cl. 126-92.00R.

Ross, Malcolm F.; and Visner, Sidney, to Combustion Engineering, Inc. In-core fuel management for nuclear reactor. 4,574,069, Cl. 376-267.000.

Ross, Peter W.: *See—*
Crossland, William A.; Peters, Jack R.; Ross, Peter W.; and Ayliffe, Peter J., 4,574,282, Cl. 340-784.000.

Roswall, Stig; and Thorhus, Lene B., to A/S Alfred Benzon. Combination formulation. 4,574,080, Cl. 424-20.000.

Roth, Ferdinando: *See—*
Biraghi, Giuseppe; Clavarino, Amedeo; Roth, Ferdinando; and Tarquini, Michele, 4,573,748, Cl. 312-7.200.

Rothe, Charles T.; and Gish, Larry D. Hydrostatic ballcock assembly. 4,573,495, Cl. 137-414.000.

Rothele, Stephan: *See—*
Leschonski, Kurt; and Rothele, Stephan, 4,573,801, Cl. 366-154.000.

Rotor Tool Company, The: *See—*
Clemens, Donald W., 4,573,370, Cl. 74-337.500.

Rowe, Lacy A. Fishing lure. 4,573,282, Cl. 43-42.150.

Royal Waterbeds, Inc.: *See—*
Winther, Howard A., 4,574,026, Cl. 156-274.400.

Rubber- en Kunststoffabriek ENBI, B. V.: *See—*
Delhaes, Johannes C., 4,573,563, Cl. 193-37.000.

Rudner, Merritt A. Prosthetic apparatus for surgical anastomosis. 4,573,471, Cl. 128-346.000.

Ruffer, Alfred; Maubach, Peter; Haas, Johannes; and Quester, Horst, to Wilh. Quester Maschinenfabrik GmbH. Charging device for opening and delivering leaf-type material. 4,573,484, Cl. 131-327.000.

Ruiz-Avila, Jose L., to AKT Consultants Pty, Limited. Apparatus for the dehydration of organic material. 4,573,278, Cl. 34-168.000.

Ruiz, Oscar F. Angiographic catheter. 4,573,476, Cl. 128-658.000.

Runyan, Wesley G., to Rockwell International Corporation. Resonance driver. 4,574,342, Cl. 363-134.000.

Ruschek, Gerhard: *See—*
Wietschorke, Stephan; Ruschek, Gerhard; and Sausner, Andreas, 4,573,441, Cl. 123-339.000.

Ruschke, Rick, to Baxter Travenol Laboratories, Inc. Medical administration set enabling sequential delivery of two liquids at different flow rate. 4,573,974, Cl. 604-81.000.

Russo, Ronald D., to Superior Plastic Products Corp. Device for draining wounds. 4,573,965, Cl. 604-30.000.

Ryan, James W.: *See—*
Gavras, Haralambos P.; Ryan, James W.; and Chung, Alfred, 4,574,079, Cl. 424-1.100.

Ryles, Roderick G.; and Robustelli, Albert G., to American Cyanamid Company. Method for using thermally stable mobility control agents for harsh environmental reservoirs. 4,573,533, Cl. 166-275.000.

S. E. Rykoff & Co.: *See—*
Smith, Jo Dee. J., 4,573,887, Cl. 417-477.000.

Sach, George S.: *See—*
Cooper, David G.; and Sach, George S., 4,574,126, Cl. 514-318.000.

Sachs, Jean-Pierre, to U.S. Philips Corporation. SECAM Color identifying circuit. 4,574,301, Cl. 358-18.000.

SAE-Societa Automatismi Elettonici s.r.l.: *See—*
Del Fabro, Marcello; and Del Fabro, Giorgio, 4,573,246, Cl. 29-252.000.

Saeki, Funio: *See—*
Io, Shinichi; and Saeki, Funio, 4,573,258, Cl. 29-596.000.

Saeki, Kimihiro; and Kobayashi, Kiyoshi, to Hukuba Kogyo Kabushiki Kaisha. Vertically moving mechanism for rotor brush in manual cleaner. 4,573,230, Cl. 15-41.00R.

Safe Bridge AB: *See—*
Larsson, Erik J., 4,573,426, Cl. 114-267.000.

Safety Equipment Corporation: *See—*
Smith, Ronald F., 4,573,699, Cl. 280-432.000.

Safety Transport Inter Development AB: *See—*
Brorsson, Tommy K. L., 4,573,708, Cl. 280-808.000.

Saggese, Giuseppe: *See—*
Cortesi, Paolo; Donati, Gianni; and Saggese, Giuseppe, 4,574,078, Cl. 423-592.000.

Saggs, Gordon J. Convertible length garment. 4,573,218, Cl. 2-93.000.

Saiki, Koji: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.

Saint, David, to Graco Metal Products Inc. Folding playpen. 4,573,224, Cl. 5-99.00C.

St. Regis Corporation: *See—*
Picotte, Ronald T., 4,573,863, Cl. 414-763.000.

Saito, Tsutomu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Play data detecting system for electronic musical instruments. 4,573,390, Cl. 84-115.000.

Saito, Yutaka: *See—*
Fujii, Shuzo; Shimada, Yuzo; Utsumi, Kazuaki; and Saito, Yutaka, 4,574,255, Cl. 331-25.000.

Sajiki, Kazuaki: *See—*
Kajiyama, Koichi; Moro, Norio; Sajiki, Kazuaki; and Yamaguchi, Tadayoshi, 4,573,792, Cl. 356-301.000.

Sakai, Yoshio; and Yamada, Takeshi, to Totoku Electric Co., Ltd. Heating sheet. 4,574,186, Cl. 219-528.000.

Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, to Nippon Piston Ring Kabushiki Kaisha. Rotary sleeve of a rotary compressor. 4,573,891, Cl. 418-173.000.

Sakamoto, Masaharu: *See—*
Takemura, Haruhiko; Kato, Kiichi; and Sakamoto, Masaharu, 4,574,371, Cl. 369-100.000.

Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Vertical adjustment device for a vehicle seat. 4,573,657, Cl. 248-575.000.

Sakamoto, Takayoshi: *See—*
Uemura, Seiichi; Hirose, Takao; Sohda, Yoshio; Sakamoto, Takayoshi; and Kishimoto, Yoshio, 4,574,077, Cl. 423-447.600.

Sakamoto, Takeshi: *See—*
Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, 4,573,422, Cl. 114-65.00R.

Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased (by Nishio, Haruko, legal representative), to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vertical type electrolytic cell and electrolytic process using the same. 4,574,037, Cl. 204-98.000.

Sampson, Earl W.: *See—*
Sampson, Norma A.; and Sampson, Earl W., 4,573,976, Cl. 604-198.000.

Sampson, James D. Pattern transposing tape. 4,574,098, Cl. 428-40.000.

Sampson, Norma A.; and Sampson, Earl W., to Smith, Dolores A., a part interest. Shielded needle. 4,573,976, Cl. 604-198.000.

Samson, Wilfred J.; and Frisbie, Jeffrey S., to Advanced Cardiovascular Systems, Inc. Low-profile steerable intraoperative balloon dilitation catheter. 4,573,470, Cl. 128-344.000.

Sanbayashi, Takeshi; and Oushiden, Hideshi, to Kabushiki Kaisha Toshiba. Exposure lamp control for image forming apparatus. 4,573,787, Cl. 355-14.00E.

Sandhaus, Sami: *See—*
Merz, Eugen; Sandhaus, Sami; and Troger, Norbert, 4,573,915, Cl. 433-64.000.

Sandstrom, Paul H.; and Friedman, Emil M., to Goodyear Tire & Rubber Company, The. Green strength of elastomers. 4,574,140, Cl. 525-123.000.

Sandy, James J., Jr.; and Huth, Brian P., to United Technologies Corporation. Sealed shroud for rotating body. 4,573,866, Cl. 415-116.000.

Santilli, Vincent J., to Westinghouse Electric Corp. Bimetallic arc shield. 4,574,169, Cl. 200-114.00B.

Sanvido, Saverio: *See—*
Arndt, Klaus; and Sanvido, Saverio, 4,573,773, Cl. 350-541.000.

Sanyo Electric Co., Ltd.: *See—*
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.

Sarkozy, Robert F., to BTU Engineering Corporation. Modular V-CVD diffusion furnace. 4,573,431, Cl. 118-725.000.

Sarl Photosysteme: *See—*
Ducos, Michel, 4,573,790, Cl. 355-28.000.

Sasajima, Yoichi: *See—*
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.

Sasaki, Kikuo, to Shimadzu Corporation. Spectrophotometer automatic adjustment for differences between nominal and actual wavelength settings. 4,573,793, Cl. 356-326.000.

Sassak, Mark S. Spaceship type toy. 4,573,938, Cl. 446-179.000.

Satellite Industries, Inc.: *See—*
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 4,574,025, Cl. 156-245.000.

Sato, Susumu; and Oshima, Hideharu, to Fuji Photo Optical Co., Ltd. Photographic recording device for video image. 4,573,780, Cl. 354-195.120.

Sato, Tetsuo, to Hitachi, Ltd. Indicating system. 4,574,276, Cl. 340-661.000.

Sato, Tomosaburo: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,574,192, Cl. 250-227.000.

Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, to Kuraray Co., Ltd. Polymer having a fluorine-containing end group and production of the same. 4,574,139, Cl. 525-61.000.

Sato, Yukihiko: *See—*
Nomura, Hirokazu; Sato, Yukihiko; and Morishige, Eiji, 4,573,666, Cl. 266-80.000.

Sauers, Paul S.: *See—*
Kaza, Michael D.; and Sauers, Paul S., 4,574,057, Cl. 260-101.000.

Saugbruksforeningen: *See—*
Harboe, Jahn, 4,573,507, Cl. 144-193.00A.

Sausner, Andreas: *See—*
Wietschorke, Stephan; Ruschek, Gerhard; and Sausner, Andreas, 4,573,441, Cl. 123-339.000.

Savage, Kerry D.; and Dowling, Donald J., to Texaco Inc. Method for measuring temperature of a hydrocarbon stratum subjected to RF electromagnetic energy. 4,573,805, Cl. 374-136.000.

Savikurki, Jarmo; and Jansson, Kim, to Hollming Ltd. Propeller device for a ship. 4,573,929, Cl. 440-54.000.

Sawyer, Richard D.: *See—*
Breault, Richard D.; Sawyer, Richard D.; and DeMarche, Thomas E., 4,574,112, Cl. 429-26.000.

Sayles, David C., to United States of America, Army. General purpose expandable adhesive. 4,574,132, Cl. 523-466.000.

Scallon, Gregory M., to Boeing Company, The. High speed digital signal processor architecture. 4,574,348, Cl. 364-200.000.

Scanlon, Robert M., to Granco-Clark, Inc. Billet heating furnace with adjustable pressurized entrance seal. 4,573,909, Cl. 432-133.000.

Scarella, Robert A.: *See—*
Musto, Joseph A.; Scarella, Robert A.; Jacquett, Harold W.; Riolo, Angelo V.; and Della Fave, Nicholas I., 4,574,089, Cl. 426-386.000.

Schaaf, Theodore F.: *See—*
Dorey, John K., II; Huneke, James T.; Madsen, Bruce S.; and Schaaf, Theodore F., 4,574,031, Cl. 156-655.000.

Schaller, Werner: *See—*
Marzendorfer, Hans; and Schaller, Werner, 4,573,418, Cl. 110-345.000.

Schallhorn, Thomas L.: *See—*
Mantela, Ralph F.; Brady, Charles J.; Johnson, Thomas M.; Larsen, Hugh W.; and Schallhorn, Thomas L., 4,573,842, Cl. 410-23.000.

Schattschneider, George K.; and Matthews, James R., to Minister of National Defence of Her Majesty's Canadian Government. Peak dynamic stress calculator. 4,574,356, Cl. 364-508.000.

Scheeren, Jan-Mathieu. Food container. 4,573,632, Cl. 229-2.50R.

Scheible, Wayne. Hand scannable portable copier and method. 4,574,317, Cl. 358-285.000.

Scherer, George W., to Corning Glass Works. Method of forming glass or ceramic article. 4,574,063, Cl. 264-60.000.

Scheuerlein, Roy E., to International Business Machines Corporation. Shared access lines memory cells. 4,574,365, Cl. 365-149.000.

Schexnayder, Michael C.: *See—*
Lovelace, Donald E.; Schexnayder, Michael C.; and Snyder, George W., 4,573,412, Cl. 102-374.000.

Schier, Gunther, to Bayerische Motoren Werke A.G. Motorcycle. 4,573,697, Cl. 280-276.000.

Schlegel, Urs; Tomse, Ljudevit; and Wenger, Urs, to Inventio AG. Load-weighing apparatus for an elevator car. 4,573,542, Cl. 177-132.000.

Schlemper, Eberhard: *See—*
Auch, Wilfried; Mohr, Friedemann; Schlemper, Eberhard; and Steudle, Walter, 4,573,795, Cl. 356-350.000.

Schlensog, Klaus; Beer, Christian; and Riedweg, Robert, to Ameda AG. Breast pump. 4,573,969, Cl. 604-74.000.

Schlumberger Technology Corporation: *See—*
Clark, Brian; and Huchital, Gerald S., 4,574,242, Cl. 324-338.000.

Schmid, Karl: *See—*
Merkator, Manfred; and Schmid, Karl, 4,573,621, Cl. 227-8.000.

Schmidt, Michael J.: *See—*
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,573,947, Cl. 464-146.000.

Schmidt-Ott, Andreas; and Siegmann, Hans-Christoph. Method for charging particles suspended in gases. 4,574,004, Cl. 55-4.000.

Schmidt, Richard B. Automatic toilet tank release. 4,573,223, Cl. 4-408.000.

Schneider, David A.: *See—*
Chiu, Norman H.; and Schneider, David A., 4,573,325, Cl. 62-129.000.

Schneider, Friedrich E.: *See—*
Stockel, Dieter; and Schneider, Friedrich E., 4,574,014, Cl. 148-11.50P.

Schneider Medintag AG: *See—*
Weikl, Andreas; and Merkel, Volkmar, 4,573,966, Cl. 604-53.000.

Schoeneberger, Carl F.: *See—*
Campbell, John G.; and Schoeneberger, Carl F., 4,574,305, Cl. 358-86.000.

Scholl, Hans-Peter: *See—*
Adams, Jurgen; and Scholl, Hans-Peter, 4,574,189, Cl. 235-30.00R.

Schottker, Willi, to P. A. Rentrop, Hubbert & Wagner Fahrzeugausstatungen GmbH & Co. KG. Hinge structure for seat with adjustable backrest. 4,573,739, Cl. 297-362.000.

Schotz, Larry. Stereophonic receiver having a noise reduction control circuit. 4,574,389, Cl. 381-10.000.

Schruben, Jeffrey J.: *See—*
Vollmer, Patricia J.; and Schruben, Jeffrey J., 4,574,117, Cl. 435-108.000.

Schulein, Rolf-Gunter: *See—*
Denter, Ulrich; and Schulein, Rolf-Gunter, 4,573,387, Cl. 83-856.000.

Schultes, Tilmann; and Stiller, Klaus, to Kortenbach & Rauh Kommanditgesellshaft. Umbrella frame with slider release mechanism. 4,573,487, Cl. 135-24.000.

Schultz, Jerold M.: *See—*
Fakirov, Stoyko C.; and Schultz, Jerold M., 4,574,108, Cl. 428-292.000.

Schulze, Heinz, to Dr. Ing. h.c.F. Porsche A.G. Tensioning device with a control mechanism for the tension of a belt. 4,573,952, Cl. 474-110.000.

Schutten, Herman P.: *See—*
Benjamin, James A.; Schutten, Herman P.; and Lade, Robert W., 4,574,207, Cl. 307-577.000.
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., 4,574,208, Cl. 307-577.000.
Lade, Robert W.; Schutten, Herman P.; and Benjamin, James A., 4,574,209, Cl. 307-577.000.

Schwartz, Jack W.: *See—*
Kwiatek, Alfred; and Schwartz, Jack W., 4,573,996, Cl. 604-897.000.

Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., to John Zink Company. Shielded smoke suppressing flare gas burner. 4,573,906, Cl. 431-202.000.

Schwerdtner, Otto v.; and Dinstuhl, Klaus, to Kraftwerk Union Aktiengesellschaft. Exhaust gas duct for gas turbines. 4,573,551, Cl. 181-218.000.

Scibetta, James S. Cable harness for an electrocardiogram device. 4,573,474, Cl. 128-644.000.

Scordo, Dominick, to AT&T Bell Laboratories. Multilocation video conference terminal including rapid video switching. 4,574,374, Cl. 370-62.000.

Scott & Fetzer Company, The: *See—*
Baird, Thomas E., Sr.; and Jailor, John J., 4,573,235, Cl. 15-328.000.
Kochte, Werner W.; and Meeker, Paul K., 4,573,234, Cl. 15-323.000.
Kochte, Werner W.; and Nimon, Susan K., 4,573,237, Cl. 15-344.000.

Seco Tools AB: *See—*
Andersson, Kjell, 4,573,836, Cl. 408-59.000.

Seino, Kuniki: *See—*
Myochin, Hisashi; and Seino, Kuniki, 4,574,326, Cl. 361-229.000.

Seki, Yoshizo, to Tomy Kogyo Co., Inc. Teaching toy. 4,573,928, Cl. 434-348.000.

Sekiguchi, Akira; Ichikawa, Takeo; Inoue, Kazuo; Fujimori, Kyoichi; Hirano, Yutaka; and Yasuhara, Seishi. Apparatus for measuring fuel injection advance angle in diesel engine. 4,573,347, Cl. 73-119.00A.

Sekijima, Kenji: *See—*
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.

Sekine, Shoji: *See—*
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.

Selfix, Inc.: *See—*
Chap, John P., 4,573,591, Cl. 211-113.000.

Sellstrom, Kathy B.; and Waddill, Harold G., to Texaco, Inc. Amine curing agents and epoxy resins cured therewith. 4,574,143, Cl. 525-438.000.

Semco Instruments, Inc.: *See—*
Moore, M. Samuel; and Paluka, Charles F., 4,573,806, Cl. 374-144.000.

Senderowicz, Daniel, to Intel Corporation. Switched capacitor filter utilizing a differential input and output circuit and method. 4,574,250, Cl. 330-258.000.

Sensormatic Electronics Corporation: *See—*
Pinneo, George G., 4,574,274, Cl. 340-572.000.

Serratelli, John F.; and Norton, Michael A., to Dow Chemical Company, The. Process for preparing copolymer polyols. 4,574,137, Cl. 524-724.000.

Setteducati, Mark: *See—*
Lamle, Stewart M.; and Setteducati, Mark, 4,573,683, Cl. 273-157.00R.

Seuring, Bernhard; Lang, Hans-Jochen; Hropot, Max; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. 5-(4-Chloro-3-sulfamoylbenzoyl)-2,3-dihydro-2-benzofurancarboxylic acids and their compositions having diuretic, saluretic and uricosuric activity. 4,574,128, Cl. 514-469.000.

Sexton, Joseph A., Jr.; and Vanwinkle, Eric J. Dimpler apparatus for nail guns. 4,573,623, Cl. 227-66.000.

Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., to General Electric Company. Method of making an automated Q-line circuit breaker. 4,573,259, Cl. 29-602.00R.

Shackelford, John R., to Hercules Incorporated. Method for retarding degradation of food colors and flavors. 4,574,086, Cl. 426-62.000.

Shanks, Gary: *See—*
Galloway, Howard R.; and Shanks, Gary, 4,573,581, Cl. 206-570.000.

Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Record material. 4,574,294, Cl. 346-210.000.

Shapiro, Eugene: *See—*
Smith, Warren F.; Shapiro, Eugene; and Winter, Joseph, 4,573,253, Cl. 29-460.000.

Shapiro, Jerrold M., to Boston University. Aqueous fluorophotometer. 4,573,778, Cl. 351-219.000.

Shapland, Earl P., to Flo-Con Systems, Inc. Valve, clamp, refractory and method. 4,573,616, Cl. 222-600.000.

Sharma, Rajeeva; and Kan, C. Eric. Caliper control system and method. 4,573,402, Cl. 100-38.000.

Sharp, Charles M., to SWS Incorporated. Method and apparatus for pulsed high energy density welding. 4,574,176, Cl. 219-121.0LD.

Sharp Kabushiki Kaisha: *See—*
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.
Yoshimura, Masahiro, 4,574,315, Cl. 358-241.000.

Sharp, William M.: *See—*
Kaufman, Charles E.; Shetler, Marvin R.; and Sharp, William M., 4,573,292, Cl. 52-79.100.

Shay, Robert W. Method of installing steering wheel lock plate on a steering wheel shaft. 4,573,252, Cl. 29-453.000.

Shea, Charles J.: *See—*
Carrier, Christian J. L.; and Shea, Charles J., 4,573,316, Cl. 60-39.823.

Sheehy, Roger C.; and Muskat, Irwin, to Granite State Packing Company. Portion pre-sliced roast beef product and process. 4,574,087, Cl. 426-129.000.

Sheldon, Donald A., to Kimberly-Clark Corporation. Outer tampon tube with finger grip. 4,573,963, Cl. 604-15.000.

Shell Oil Company: *See—*
Kipp, Robert M.; and Ayers, Ray R., 4,573,713, Cl. 285-319.000.
Thompson, Mark S., 4,574,120, Cl. 502-220.000.

Shellhause, Ronald L., to General Motors Corporation. Method of manufacturing brake shoe assembly. 4,573,249, Cl. 29-432.000.

Shellhause, Ronald L., to General Motors Corporation. Drum brake. 4,573,557, Cl. 188-216.000.

Shelton, Glenn F. Apparatus and method for generating hydrogen gas for use as a fuel additive in diesel engines. 4,573,435, Cl. 123-3.000.

Shepherd, Michael, to Wallace Murray Corporation. Subway electric motor and fan construction. 4,573,559, Cl. 192-58.00B.

Shetler, Marvin R.: *See—*
Kaufman, Charles E.; Shetler, Marvin R.; and Sharp, William M., 4,573,292, Cl. 52-79.100.

Shibahara, Yoshihiko: *See—*
Arakawa, Satoshi; Matsuda, Terumi; Ishizuka, Akio; and Shibahara, Yoshihiko, 4,574,102, Cl. 428-212.000.

Shiga, Minoru: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; Saiki, Koji; and Nishio, Tsutomu, deceased, 4,574,037, Cl. 204-98.000.

Shimada, Yuzo: *See—*
Fujii, Shuzo; Shimada, Yuzo; Utsumi, Kazuaki; and Saito, Yutaka, 4,574,255, Cl. 331-25.000.

Shimadzu Corporation: *See—*
Sasaki, Kikuo, 4,573,793, Cl. 356-326.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,573,949, Cl. 474-80.000.
Nagano, Masashi, 4,573,950, Cl. 474-80.000.
Nagano, Masashi, 4,573,951, Cl. 474-82.000.

Shimbo, Chiaki: *See—*
Simada, Tamotu; Shimbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,573,466, Cl. 128-303.100.

Shimizu, Yasuo; and Ogura, Masami, to Honda Giken Kogyo Kabushiki Kaisha. Lubrication system for auxiliary equipment transmission. 4,573,373, Cl. 74-468.000.

Shimura, Norio: *See—*
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.

Shin, Warren J., to Mannesmann Tally Corporation. Vibration isolating coupling. 4,573,363, Cl. 74-1.0SS.

Shiraishi, Hideo, to Fuji Electric Corporate Research & Development Co., Ltd. Gas analyzing apparatus. 4,574,042, Cl. 204-429.000.

Shireman, Mark J.: *See—*
Benson, Florence; and Shireman, Mark J., 4,573,430, Cl. 118-411.000.

Shoei Chemical Inc.: *See—*
Asada, Eiichi; Inokuma, Toshio; and Yamazoe, Mikio, 4,574,055, Cl. 252-514.000.

Showers, Robert A. Doll and means for standing same. 4,573,940, Cl. 446-376.000.

Shuttlewood, Jeffrey R.: *See—*
Lee, Graham L.; Shuttlewood, Jeffrey R.; and Ambrose, John W., 4,573,505, Cl. 141-92.000.

Shymon, Stephen J., to Colgate-Palmolive Co. Antiplaque dentifrice having improved flavor. 4,574,081, Cl. 424-52.000.

Sidles, James: *See—*
Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., 4,573,894, Cl. 425-36.000.

Siegmann, Hans-Christoph: *See—*
Schmidt-Ott, Andreas; and Siegmann, Hans-Christoph, 4,574,004, Cl. 55-4.000.

Sieling, Roger L.: *See—*
Johnson, Carl N.; Phadke, Hemant; and Sieling, Roger L., 4,573,398, Cl. 92-101.000.

Siemens Aktiengesellschaft: *See—*
Henkel, Hans-Joachim; and Muller, Norbert, 4,574,111, Cl. 428-461.000.
Hirschberg, Jakub, 4,573,480, Cl. 128-784.000.
Reiss, Ruediger, 4,574,392, Cl. 381-51.000.

Signal Companies, Inc., The: *See—*
Polak, Anthony J.; Wrezel, James A.; and Beuhler, Allyson J., 4,573,768, Cl. 350-357.000.

Sillard, Gilles; and Baril, Michel, to Thomson CSF. Passive electromagnetic wave duplexer for millimetric antenna. 4,574,288, Cl. 343-781.00P.

Silver Seiko, Ltd.: *See—*
Aoki, Hideo; and Takahashi, Kazuaki, 4,573,813, Cl. 400-214.000.

Simada, Tamotu; Shimbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, to Hitachi, Ltd. Surgical equipment. 4,573,466, Cl. 128-303.100.

Simovits, Stephen S., Jr., to American Plasticraft Co. Spark gap device for a cathode ray tube socket. 4,573,755, Cl. 339-111.000.

Sims, Karl: *See—*
Resnikoff, Howard L.; Poggio, Tomaso; and Sims, Karl, 4,574,311, Cl. 358-213.000.

Simson, Anton K.: *See—*
Streetman, Joe W.; and Simson, Anton K., 4,573,396, Cl. 89-36.080.

Sinar, Michael M., to United States Steel Corporation. Apparatus for absorbing a force applied to a cable or the like. 4,573,620, Cl. 226-190.000.

Sinclair, Stuart W., to Long Reach Manufacturing Co. Clamping attachment for a lift truck having two pivoting arms. 4,573,858, Cl. 414-620.000.

Singer, Jerome R., to University of California, The Regents of the. Method for flow measurement using nuclear magnetic resonance. 4,574,239, Cl. 324-306.000.

Singer, Jerome R.: *See—*
Libove, Joel M.; and Singer, Jerome R., 4,574,240, Cl. 324-306.000.

Singer Spezialnadelfabrik GmbH: *See—*
Bergrath, Siegmar; and Kappertz, Fritz, 4,573,575, Cl. 206-380.000.

Singh, Donald R., to Honeywell Inc. Varactor tuned microstrip oscillator for Ka band operation. 4,574,256, Cl. 331-107.0SL.

Sinkora, Frank. Denture stabilizer for musician. 4,573,919, Cl. 433-140.000.

Sitt, Rudiger: *See—*
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,574,124, Cl. 514-228.000.

Sitterle, George, to Vistakon, Inc. Soft toric contact lens. 4,573,774, Cl. 351-160.00H.

Siwiak, Kazimierz, to Motorola, Inc. High gain vertically polarized antenna structure. 4,574,290, Cl. 343-827.000.

Skrentner, Frank C., to Lamb Technicon Corp. Piston counterboring machine. 4,573,840, Cl. 409-200.000.

Slack, Robert A., to United States of America, Navy. Constant rise AGC device. 4,574,252, Cl. 330-281.000.

Slat, William A., to Plastipak Packaging, Inc. Plastic container with vapor barrier. 4,573,596, Cl. 215-12.00R.

Slindee, Edward A., to International Harvester Company. Needle position indicator for a fuel injection nozzle holder. 4,573,349, Cl. 73-119.00A.

Small, Marc J.; and Powers, David E., to Good Displays, Inc. Modular panel construction. 4,573,513, Cl. 160-135.000.

Smith, Alexander; and Baggs, Burton D., to White, E. E. Beltless swingarm mower. 4,573,306, Cl. 56-10.400.

Smith, David J.: *See—*
Yates, John B., III; and Smith, David J., 4,574,144, Cl. 525-435.000.

Smith, Dolores A.: *See—*
Sampson, Norma A.; and Sampson, Earl W., 4,573,976, Cl. 604-198.000.

Smith, Gareth J. Anchoring bolt device. 4,573,844, Cl. 411-340.000.

Smith, Harry D., Jr.: *See*—
Arnold, Dan M.; and Smith, Harry D., Jr., 4,574,193, Cl. 250-270.000.
Smith, Jo Dee. J., to S. E. Rykoff & Co. Corrosion-resistant roller-type pump. 4,573,887, Cl. 417-477.000.
Smith, John L.; and Jenner, Frank H., to Marconi Instruments Limited. Electrical interface arrangements. 4,573,756, Cl. 339-117.00P.
Smith Kline & French Laboratories Limited: *See*—
Cooper, David G.; and Sach, George S., 4,574,126, Cl. 514-318.000.
Smith, Louis W.; and Csapo, Janos I., to GTE Business Communication Systems Inc. Secretarial answering system. 4,574,165, Cl. 179-18.0BD.
Smith, Lyle, to Alpha Molding Technologies Associates. Evacuation system for injection molding machines. 4,573,900, Cl. 425-157.000.
Smith & Nephew Associated Companies P.L.C.: *See*—
Potter, William D.; and Kiamil, Sinan B., 4,574,130, Cl. 523-111.000.
Smith, Richard C.: *See*—
Young, Henry N., IV; and Smith, Richard C., 4,573,685, Cl. 273-173.000.
Smith, Ronald F., to Safety Equipment Corporation. Trailer back-up coupling. 4,573,699, Cl. 280-432.000.
Smith, Warren F.; Shapiro, Eugene; and Winter, Joseph, to Olin Corporation. Optical fiber cable fabrication technique. 4,573,253, Cl. 29-460.000.
Smith, William T.; Rooney, Timothy M.; and Watts, George T., to Goodyear Tire & Rubber Company, The. Run flat device. 4,573,509, Cl. 152-158.000.
Smolley, Robert, to TRW Inc. Multi-element circuit construction. 4,574,331, Cl. 361-393.000.
Snia Fibre S.p.A.: *See*—
Ciaperoni, Aldemaro; and Cappelli, Alberto, 4,574,054, Cl. 252-188.310.
Snodgrass, Kirk A., to Rockwell International Corporation. RF Power amplifier for use with VHF transceivers. 4,574,248, Cl. 330-2.000.
Snyder, George W.: *See*—
Lovelace, Donald E.; Schexnayder, Michael C.; and Snyder, George W., 4,573,412, Cl. 102-374.000.
Snyder, William B., to Union Carbide Corporation. Low density tantalum anode bodies. 4,574,333, Cl. 361-433.000.
Societe Nationale Elf Aquitaine: *See*—
Josse, Jean-Jacques; Pujols, Guy; and Di Vincenzo, Serge, 4,573,541, Cl. 175-78.000.
Sohda, Yoshio: *See*—
Uemura, Seiichi; Hirose, Takao; Sohda, Yoshio; Sakamoto, Takayoshi; and Kishimoto, Yoshio, 4,574,077, Cl. 423-447.600.
Solco Basel AG: *See*—
Marx, Gunter H., 4,573,992, Cl. 604-408.000.
Soltis, Frank G.: *See*—
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.
Sony Corporation: *See*—
Kobayashi, Masahiro, 4,574,008, Cl. 65-155.000.
Soules, Thomas F.: *See*—
Bateman, Robert L., Jr.; and Soules, Thomas F., 4,574,218, Cl. 313-635.000.
Soyring, John A.: *See*—
Dang, Lam Q.; Geer, Charles P.; Houdek, Merle E.; Jones, Eugene R.; Soltis, Frank G.; Soyring, John A.; and Walker, Thomas M., 4,574,351, Cl. 364-200.000.
Span-America Medical Systems, Inc.: *See*—
Spann, Donald C., 4,573,456, Cl. 128-80.00R.
Spann, Donald C., to Span-America Medical Systems, Inc. Foam body support. 4,573,456, Cl. 128-80.00R.
Spector, Donald. Aroma-generating automobile cigarette lighter. 4,574,181, Cl. 219-274.000.
Spector, George: *See*—
Webb, Ted H.; and Spector, George, 4,573,445, Cl. 124-22.000.
Willbanks, Weldon C.; and Spector, George, 4,573,846, Cl. 414-24.600.
Spelber, Leonard G., to Wastemate Corporation. Water powered waste disposer with improved dynamic seal. 4,573,642, Cl. 241-46.00B.
Speros, Dimitri M.: *See*—
Davenport, John M.; Hansler, Richard L.; Potter, Ralph M.; Blank, John M.; Speros, Dimitri M.; Homa, Arthur S.; Mishra, Amarendra; and Leskovec, Robert A., 4,574,219, Cl. 315-49.000.
Sperry, Charles R.: *See*—
Hargrove, William W.; Harris, Dale C.; Akers, Michael J.; and Sperry, Charles R., 4,573,967, Cl. 604-56.000.
Sperry Corporation: *See*—
Kirk, Kenneth H.; and Tarbuck, Robert R., 4,573,254, Cl. 29-564.800.
Spierings, Gijsbertus A. C. M.: *See*—
Joormann, Hendrik J. M.; and Spierings, Gijsbertus A. C. M., 4,573,762, Cl. 350-96.340.
Spindel, Howard R.; Ast, Vincent N., Jr.; and Brown, Gary L., to Tektronix, Inc. Block mode digital signal conditioning method and apparatus. 4,574,362, Cl. 364-900.000.
Spinelli, Enrico, to Mr. Christmas Incorporated. Artificial tree limb maker machine. 4,573,247, Cl. 29-417.000.
Spong, Richard V.: *See*—
Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,573,262, Cl. 29-739.000.
Sprague Electric Company: *See*—
Crews, James E.; and Rodriguez, George H., 4,574,187, Cl. 219-541.000.
Sprow, Earnest A. Centrifugal jig for ore beneficiation. 4,574,046, Cl. 209-44.000.
Spruce, Frank: *See*—
Rosiek, Jozef; Spruce, Frank; and Atkinson, Brian, 4,573,446, Cl. 126-92.00R.
Spruck, Helmut, to Leybold-Heraeus GmbH. Electron gun. 4,574,178, Cl. 219-121.0ET.
Spurbeck, Kenneth C., to Pneumo Corporation. Spherical ball drive mechanism for a direct drive valve. 4,573,494, Cl. 137-331.000.
Square D Company: *See*—
Franks, Terry E., 4,574,260, Cl. 335-18.000.
Srinivasan, Gurumakonda R.: *See*—
Lechaton, John S.; Pitner, Philip M.; and Srinivasan, Gurumakonda R., 4,573,256, Cl. 29-576.00B.
Sroka, John S. Lightweight power wrench. 4,573,377, Cl. 81-57.200.
Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M. A., 4,574,372, Cl. 369-244.000.
Staar Surgical Co.: *See*—
Mazzocco, Thomas R., 4,573,998, Cl. 623-6.000.
Stadler, Peter: *See*—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.
Stalherm, Dieter: *See*—
Lemke, Otto; Stalherm, Dieter; and Haack, Reimer, 4,574,034, Cl. 201-1.000.
Stamper, Richard W.; and Hultz, Robert C., to General Tire & Rubber Company, The. Vinyl chloride polymer laminate. 4,574,103, Cl. 428-213.000.
Stanczak, Stephen J.: *See*—
Highley, Robert W.; and Stanczak, Stephen J., 4,574,035, Cl. 202-242.000.
Standard Oil Company, The: *See*—
Cull, Ronald C.; Hartman, Robert A.; and Koch, Paul E., 4,574,160, Cl. 136-245.000.
Standard Oil Company (Ohio), The: *See*—
Pyke, Stephen C.; and Bruce, Mark R., 4,574,039, Cl. 204-290.00R.
Stanek, Jaroslav: *See*—
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,574,058, Cl. 260-112.50R.
Stanley Works, The: *See*—
Valenti, Richard L.; and McCormick, Daniel J., 4,573,239, Cl. 16-273.000.
Stanton, Austin N. Torque orientation device. 4,573,651, Cl. 244-165.000.
Stanzel, Victor. Jet propelled model airplane. 4,573,937, Cl. 446-31.000.
Starcevic, Mihailo: *See*—
Fust, Armin; and Starcevic, Mihailo, 4,573,810, Cl. 384-322.000.
Stark, Ewald: *See*—
Bezler, Wilhelm; and Stark, Ewald, 4,573,408, Cl. 101-248.000.
Starkweather, John H.: *See*—
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., 4,573,865, Cl. 415-115.000.
Starling, Jeffrey T.; and Jones, Bruce D., to Worthington Industries, Inc. Fluid container. 4,573,603, Cl. 220-5.00R.
Starr, Daniel C., to AT&T Bell Laboratories. Shared resource locking apparatus. 4,574,350, Cl. 364-200.000.
Stauffer Chemical Company: *See*—
Leone-Bay, Andrea; and Timony, Peter E., 4,574,010, Cl. 71-92.000.
STE Look: *See*—
Beyl, Jean; Bernard, Jean; le Faou, Daniel; and Peyre, Henri, 4,573,700, Cl. 280-605.000.
Steensen, Wayne L.; and Weaver, Ronald C., to Nabisco Brands, Inc. Aspartame-sweetened gelatin dessert and sweetening composition therefor. 4,574,091, Cl. 426-548.000.
Stegmeier, William J. Method for securing concrete form board to pool and maintaining concrete from pool liner track. 4,574,017, Cl. 156-60.000.
Steinberger, Rolf: *See*—
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, 4,574,131, Cl. 523-209.000.
Steirische Wasserkraft- und Elektrizitaets-AG: *See*—
Marzendorfer, Hans; and Schaller, Werner, 4,573,418, Cl. 110-345.000.
Stellram S.A.: *See*—
Bonjour, Christian; and Duvanel, Francois, 4,574,011, Cl. 75-241.000.
Stelly, C. L. Jack. Marine surveying apparatus and method for locating pipelines buried under the seabed. 4,574,241, Cl. 324-326.000.
Stephan, Willi: *See*—
Mall, Gunther; Dietrich, Herbert; and Stephan, Willi, 4,573,421, Cl. 112-146.000.
Stern, Howard: *See*—
Hecker, Joel; Stern, Howard; and Heydenburg, Thomas, 4,573,758, Cl. 350-3.710.
Steudle, Walter: *See*—
Auch, Wilfried; Mohr, Friedemann; Schlemper, Eberhard; and Steudle, Walter, 4,573,795, Cl. 356-350.000.

Stevens, Julius J., to Teledyne Industries, Inc. Bearing support and seal for a starter motor housing. 4,574,213, Cl. 310-90.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Malhotra, Satish K., 4,573,280, Cl. 42-7.000.

Stiller, Klaus: *See—*
Schultes, Tilmann; and Stiller, Klaus, 4,573,487, Cl. 135-24.000.

Stine, Harold R., to Fulton Industries, Inc. Interlocking lens structure for a signal lamp. 4,574,339, Cl. 362-360.000.

Stiver, Robert N. G. Fly tying combination tool. 4,573,718, Cl. 289-17.000.

Stockel, Dieter; and Schneider, Friedrich E., to G. Rau GmbH & Co. Process for manufacturing a formed contact part. 4,574,014, Cl. 148-11.50P.

Stocksiefen, Peter; and Gruber, Alfons, to Industrietechnik Kalenborn GmbH. Pipe cleaning device. 4,573,231, Cl. 15-104.06R.

Stoner, Eugene M., to Ares, Inc. Linkless ammunition magazine with shell buffer. 4,573,395, Cl. 89-33.160.

Stoop, Charles W. Paint roller assembly for painting chain link fences and similar structures. 4,573,233, Cl. 15-230.110.

Straub, Paul: *See—*
Maag, Wilhelm; and Straub, Paul, 4,573,568, Cl. 198-731.000.

Streetman, Joe W.; and Simson, Anton K., to General Dynamics Corporation/Convair Div. Nuclear blast hardened mobile vehicle. 4,573,396, Cl. 89-36.080.

Stricker, David K.: *See—*
Hoch, John J.; and Stricker, David K., 4,573,544, Cl. 180-68.100.

Stroem, Sigmunn, to A/S Kongsberg Vapenfabrikk. Low pressure loss, convectively gas-cooled inlet manifold for high temperature radial turbine. 4,573,315, Cl. 60-39.370.

Stroem, Sigmunn; and Mowill, Rolf J., to A/S Kongsberg Vapenfabrikk. High area ratio, variable entrance geometry compressor diffuser. 4,573,868, Cl. 415-157.000.

Strohl, Robert L.; Moore, Paul E.; and Toth, Alexander, to Arcair Company. Self-contained exothermic cutting system. 4,573,665, Cl. 266-48.000.

Stronghold International AG: *See—*
Ripoll, Javier G., 4,573,662, Cl. 254-29.00A.

Strouse, Douglas A., to RCA Corporation. System for identifying envelopes having excessive panel-funnel offset and dispensing articles. 4,573,934, Cl. 445-3.000.

Stunkel, Klaus G.: *See—*
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.

Sturtzkopf, Robert. Device for determining the relative position of the upper jaw and lower jaw for the production of dentures. 4,573,916, Cl. 433-71.000.

Stuttgen, Friedel: *See—*
Ippen, Jakob; and Stuttgen, Friedel, 4,573,510, Cl. 152-159.000.

Styers, C. James, to Rockwell International Corporation. Electronic flight instrument design and evaluation tool. 4,573,925, Cl. 434-49.000.

Suarez, Diego R. Container and handling apparatus therefor. 4,573,850, Cl. 414-382.000.

Sudduth, Donald L. Ultraviolet light curing apparatus. 4,573,277, Cl. 34-4.000.

Sudo, Kanzaburo: *See—*
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.

Suenaga, Nobuyuki: *See—*
Sugiyama, Seiji; Suenaga, Norihiro; Suenaga, Nobuyuki; and Kaneda, Michihiro, 4,573,465, Cl. 128-303.100.

Suenaga, Norihiro: *See—*
Sugiyama, Seiji; Suenaga, Norihiro; Suenaga, Nobuyuki; and Kaneda, Michihiro, 4,573,465, Cl. 128-303.100.

Sueoka, Tetsuro; and Kubo, Takeharu, to Kabushiki Kaisha Meidensha. Gate turn-off thyristor with a cathode base layer having four distinct impurity concentrations. 4,574,296, Cl. 357-38.000.

Suga, Masaaki: *See—*
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Murasugi, Takashi; and Suzuki, Tadashi, 4,573,375, Cl. 74-863.000.

Sugimoto, Jiro: *See—*
Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, 4,574,156, Cl. 544-398.000.

Sugita, Katsuhiko; and Uehara, Makoto, to Tsudakoma Kogyo Kabushiki Kaisha. Weft detection stopper for looms. 4,573,499, Cl. 139-370.200.

Sugiyama, Seiji; Suenaga, Norihiro; Suenaga, Nobuyuki; and Kaneda, Michihiro, to Nippon Infrared Industries Co., Ltd. Laser irradiation apparatus. 4,573,465, Cl. 128-303.100.

Sugizaki, Kyoichi: *See—*
Hadama, Shigeyuki; and Sugizaki, Kyoichi, 4,573,890, Cl. 418-108.000.

Sulfstede, Louis E.; Bergt, Carl; and Helt, Robert W., to American Standard Inc. Adaptive defrost control for heat pump system. 4,573,326, Cl. 62-156.000.

Sullivan, Harry E.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.

Sullivan, Norman D.; and Baker, Forrest E., to Automated Portion Control Technology, Inc. Pizza docker. 4,573,388, Cl. 83-867.000.

Sultzbaugh, S. Ray. Game. 4,573,689, Cl. 273-348.000.

Sulzer Brothers Limited: *See—*
Meyer, Wolfgang K.; and Breyer, Fritz-Werner, 4,573,856, Cl. 414-561.000.

Sumitomo Electric Industries, Ltd.: *See—*
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Kato, Itsuro; and Kato, Tsutomu, 4,573,428, Cl. 118-60.000.

Sumitomo Metal Industries, Ltd.: *See—*
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.

Sunbelt America Corporation: *See—*
Thrash, Tommy K.; Tock, Richard W.; Cox, Lyle V.; and Quattlebaum, W. Gregg, 4,573,447, Cl. 126-263.000.

Sundstrand Corporation: *See—*
Chapman, David N., 4,573,661, Cl. 251-234.000.

Sundstrand Data Control, Inc.: *See—*
Bateman, Charles D., 4,574,360, Cl. 364-567.000.

Superior Plastic Products Corp.: *See—*
Russo, Ronald D., 4,573,965, Cl. 604-30.000.

Supfina Maschinenfabrik Hentzen GmbH & Co KG: *See—*
Wieck, Karl, 4,573,289, Cl. 51-57.000.

Suzuki, Kenji, to Canon Kabushiki Kaisha. Focus detecting apparatus. 4,573,784, Cl. 354-406.000.

Suzuki, Koji: *See—*
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,573,788, Cl. 355-14.00R.

Suzuki, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone generation device of waveshape memory type. 4,573,389, Cl. 84-1.260.

Suzuki, Tadashi: *See—*
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Murasugi, Takashi; and Suzuki, Tadashi, 4,573,375, Cl. 74-863.000.

Suzuki, Takamasa: *See—*
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, 4,573,693, Cl. 277-212.0FB.

Svyatsky, Eduard; Rabindran, K. George; and Faber, Thomas J., to Bell & Howell Company. Document feeder. 4,573,675, Cl. 271-122.000.

Swank, Robert P., to Leiter Swank Industries, Inc. Combination multiple compartment storage bin and sorting tray. 4,573,751, Cl. 312-211.000.

Sweeney, Thomas F., to Vetco Offshore, Inc. Marine riser coupling assembly. 4,573,714, Cl. 285-363.000.

Sweet, Roger H.: *See—*
Crow, Granville; Renger, Larry H.; and Sweet, Roger H., 4,573,944, Cl. 446-465.000.

Swift, David W., to Pilkington P.E. Limited. Optical display apparatus. 4,573,759, Cl. 350-3.850.

Swinderman, Robert T., to Martin Engineering Company. Conveyor housing access port. 4,573,567, Cl. 198-860.400.

Swingline Inc.: *See—*
Olesen, Paul; Lensky, Albert; and Pendzich, Richard J., 4,573,625, Cl. 227-131.000.

Swiss Aluminium Ltd.: *See—*
Friedli, Hans; and Gut, Edwin, 4,574,019, Cl. 156-73.600.
Meyer, Klaus, 4,574,073, Cl. 423-111.000.

Swiss Fabricating, Inc.: *See—*
Lienhard, Robert W., 4,573,294, Cl. 52-93.000.

SWS Incorporated: *See—*
Sharp, Charles M., 4,574,176, Cl. 219-121.0LD.

Symons, James D.: *See—*
DeHart, Arnold O.; and Symons, James D., 4,573,690, Cl. 277-1.000.

Szachowicz, Edward H.; and Walsh, John, to Implant Technologies. Talking tracheostomy tube. 4,573,460, Cl. 128-200.260.

Tabata, Kuniaki; Tsuhara, Susumu; Machida, Tetsuo; Iwami, Hidefumi; and Okada, Yasuyuki, to Hitachi, Ltd. Method and apparatus for controlling image display. 4,574,364, Cl. 364-900.000.

Tachikawa Spring Co., Ltd.: *See—*
Sakamoto, Takao, 4,573,657, Cl. 248-575.000.

Taco Bell: *See—*
Cortopassi, Jeffery J., 4,573,570, Cl. 206-45.330.

Tadokoro, Yoshiharu, to Kurimoto, Ltd. Discharge control valve. 4,573,492, Cl. 137-239.000.

Taka, Masahiro: *See—*
Irie, Kazunari; Taka, Masahiro; and Murakami, Hideyo, 4,574,383, Cl. 375-27.000.

Takagi, Hiroshi: *See—*
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.

Takahashi, Hideaki; Kondo, Haruyoshi; Takeuchi, Takashi; Hayakawa, Kiyoharu; and Muraki, Hideaki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Thin film oxygen sensor with microheater. 4,574,264, Cl. 338-34.000.

Takahashi, Hirotake; and Nishikawa, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle steering mechanism. 4,573,698, Cl. 280-279.000.

Takahashi, Kazuaki: *See—*
Aoki, Hideo; and Takahashi, Kazuaki, 4,573,813, Cl. 400-214.000.

Takara Co. Ltd.: *See—*
Ogawa, Iwakichi, 4,573,942, Cl. 446-457.000.

Takasaki, Masaru; and Aoyama, Masutoshi, to Nissan Motor Co., Ltd. Light assembly with flexed thermoplastic fresnel lens. 4,574,338, Cl. 362-278.000.
Takatsuji, Masamoto: *See—*
Simada, Tamotu; Shimbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,573,466, Cl. 128-303.100.
Takayanagi, Yoshiaki: *See—*
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,573,788, Cl. 355-14.00R.
Takeda Riken Co., Ltd.: *See—*
Yada, Eiichi, 4,574,271, Cl. 340-347.0NT.
Takei, Toshihiro: *See—*
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,573,882, Cl. 417-366.000.
Takemura, Haruhiko; Kato, Kiichi; and Sakamoto, Masaharu, to Olympus Optical Company Limited. Apparatus for recording and reproducing information on an optical disc. 4,574,371, Cl. 369-100.000.
Takeuchi, Shin: *See—*
Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, 4,573,422, Cl. 114-65.00R.
Takeuchi, Takashi: *See—*
Takahashi, Hideaki; Kondo, Haruyoshi; Takeuchi, Takashi; Hayakawa, Kiyoharu; and Muraki, Hideaki, 4,574,264, Cl. 338-34.000.
Takikawa, Osamu; and Harata, Mitsuo, to Kabushiki Kaisha Toshiba. Thermal head. 4,574,292, Cl. 346-76.0PH.
Talarico, Robert J.: *See—*
Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,573,262, Cl. 29-739.000.
Tamamushi, Takashige: *See—*
Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,574,310, Cl. 358-212.000.
Tamir, Shoshana: *See—*
Zahavi, Joseph; and Tamir, Shoshana, 4,574,041, Cl. 204-38.300.
Tamura, Yukio: *See—*
Asano, Makoto; Hasegawa, Kiyoharu; Tamura, Yukio; and Oono, Yoshihiro, 4,574,110, Cl. 428-402.210.
Tanaami, Masaaki: *See—*
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Tanaka, Atsuo: *See—*
Donomoto, Tadashi; Tanaka, Atsuo; and Katou, Shinji, 4,573,519, Cl. 164-97.000.
Tanaka, Motoaki: *See—*
Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, 4,574,156, Cl. 544-398.000.
Tanaka, Shigeru: *See—*
Nogi, Hiroyoshi; and Tanaka, Shigeru, 4,573,674, Cl. 271-118.000.
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,573,547, Cl. 180-168.000.
Tanaka, Sumio: *See—*
Atsumi, Shigeru; and Tanaka, Sumio, 4,574,273, Cl. 307-475.000.
Tandem Computers Incorporated: *See—*
Harris, Richard L.; and Horst, Robert W., 4,574,344, Cl. 364-200.000.
Tangorra, Giorgio, to Industrie Pirelli S.p.A. Driving belt. 4,573,953, Cl. 474-152.000.
Tani, Tadaaki: *See—*
Adachi, Keiichi; Ikeda, Tadashi; and Tani, Tadaaki, 4,574,115, Cl. 430-522.000.
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Flash photographing system. 4,573,786, Cl. 354-416.000.
Tanikawa, Kunihiro; and Ohtsuki, Osamu, to Fujitsu Limited. Charge coupled device having meandering channels. 4,574,295, Cl. 357-24.000.
Tarbuck, Robert R.: *See—*
Kirk, Kenneth H.; and Tarbuck, Robert R., 4,573,254, Cl. 29-564.800.
Tarcsay, Lajos: *See—*
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,574,058, Cl. 260-112.50R.
Tarquini, Michele: *See—*
Biraghi, Giuseppe; Clavarino, Amedeo; Roth, Ferdinando; and Tarquini, Michele, 4,573,748, Cl. 312-7.200.
Tate, Ernest L. Combination electric power bus and fluorescent drop light. 4,574,220, Cl. 315-57.000.
Tateishi, Masaru: *See—*
Murata, Seiichiro; Tateishi, Masaru; Hayakawa, Kohji; Sakamoto, Takeshi; Takeuchi, Shin; and Mukasa, Kohsuke, 4,573,422, Cl. 114-65.00R.
Taucher, Robert: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,573,701, Cl. 280-616.000.
Tavitian, Vartan M.: *See—*
Westeren, Herbert W.; Harrison, Ronald A.; and Tavitian, Vartan M., 4,573,667, Cl. 266-114.000.
Taylor, David L.: *See—*
Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Haggard, Eugene E.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; Sullivan, Harry E.; Mason, Arvil B.; and Lucas, Wayne M., 4,573,829, Cl. 405-157.000.
Taylor, Stewart S., to Tektronix, Inc. High impedance current source. 4,574,233, Cl. 323-316.000.
Taylor-Winfield Corporation, The: *See—*
Mullane, William E.; and Lund, David, 4,573,260, Cl. 29-623.100.
Technion Research and Development Foundation Ltd.: *See—*
Zahavi, Joseph; and Tamir, Shoshana, 4,574,041, Cl. 204-38.300.
Tecnovar Italiana S.p.A.: *See—*
Fontana, Ludovico, 4,573,393, Cl. 89-1.590.
Tedder, Thomas E.: *See—*
Rich, Alan H.; Gaasterland, Douglas E.; and Tedder, Thomas E., 4,573,467, Cl. 128-303.100.
Tegtmeier, Sheldon D., to Tegtmeier & Sons, Inc. Hydraulic stabilizing mechanism for use with hydraulic elevating system. 4,573,742, Cl. 298-11.000.
Tegtmeier & Sons, Inc.: *See—*
Tegtmeier, Sheldon D., 4,573,742, Cl. 298-11.000.
Tejas Designs, Inc.: *See—*
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Mihalik, Michael A.; Hoeren, Gerd H.; Reiney, Michael G.; Besemer, James J.; and Palmquist, Steven R., 4,574,354, Cl. 364-481.000.
Spindel, Howard R.; Ast, Vincent N., Jr.; and Brown, Gary L., 4,574,362, Cl. 364-900.000.
Taylor, Stewart S., 4,574,233, Cl. 323-316.000.
Wimmer, Guenther W., 4,574,291, Cl. 346-75.000.
Teledyne Industries, Inc.: *See—*
Stevens, Julius J., 4,574,213, Cl. 310-90.000.
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Dahlqvist, Ingemar E., 4,574,376, Cl. 370-103.000.
Temple, Davis L., Jr.: *See—*
Nair, Xina; and Temple, Davis L., Jr., 4,574,129, Cl. 514-540.000.
Teng, Nelson N. H.: *See—*
Kaplan, Henry S.; Teng, Nelson N. H.; Lam, Kit S.; and Calvo-Riera, Francisco, 4,574,116, Cl. 435-68.000.
Tenmyo, Shigemoto: *See—*
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,574,369, Cl. 369-44.000.
Teraguchi, Yuji; and Endo, Sadayoshi, to Clarion Co., Ltd. Channel changing mechanism of a tape player. 4,574,322, Cl. 360-74.100.
Teraoka, Masanori; and Matsuda, Terumi, to Fuji Photo Film Company, Ltd. Radiation image storage panel. 4,574,195, Cl. 250-327.200.
Termolar S/A: *See—*
de Freitas, Elias M., 4,573,613, Cl. 222-213.000.
Terui, Michio: *See—*
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.
Terumo Kabushiki Kaisha: *See—*
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Tesch, Sylvester H., Jr.: *See—*
Tesch, Sylvester M., Jr., 4,573,609, Cl. 221-211.000.
Tesch, Sylvester M., Jr., to Tesch, Sylvester H., Jr.; Tesch, Marlynn F.; Rasmussen, Harvey J.; Rasmussen, Patricia; and Rasmussen, Harvey E. Seed planting apparatus. 4,573,609, Cl. 221-211.000.
Teshigawara, Hiroshi: *See—*
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,573,908, Cl. 432-58.000.
Tetra Pak International AB: *See—*
Billberg, Alf, 4,573,957, Cl. 493-309.000.
Texaco Inc.: *See—*
Barot, Devendra T., 4,574,002, Cl. 48-77.000.
Savage, Kerry D.; and Dowling, Donald J., 4,573,805, Cl. 374-136.000.
Sellstrom, Kathy B.; and Waddill, Harold G., 4,574,143, Cl. 525-438.000.
Texas Instruments Incorporated: *See—*
Wang, Chung S., 4,574,177, Cl. 219-121.0PE.
Thermal Design, Inc.: *See—*
Harkins, Daniel J., 4,573,298, Cl. 52-404.000.
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, to BASF Aktiengesellschaft. Preparation of high-impact nylon molding materials. 4,574,131, Cl. 523-209.000.
Thinking Machines Corporation: *See—*
Resnikoff, Howard L.; Poggio, Tomaso; and Sims, Karl, 4,574,311, Cl. 358-213.000.
Thirion de Briel, Jacques, to Valeo. Speed variator pulley. 4,573,948, Cl. 474-28.000.
Tholander, Lars H. G.: *See—*
Hellstrom, Jerker; Tholander, Lars H. G.; and Jacobsson, Kurt A. G., 4,574,353, Cl. 364-470.000.
Thomas, Robert J., to Eagle Industries, Inc. Three-dimensional flexible reflectors. 4,573,763, Cl. 350-105.000.
Thomas, Simon A.: *See—*
Matthews, Andrew J.; and Thomas, Simon A., 4,574,051, Cl. 252-70.000.
Thompson, Earl C. Side activated animal watering valve. 4,573,433, Cl. 119-72.500.
Thompson, Mark S., to Shell Oil Company. Method for preparing high activity silica supported hydrotreating catalysts. 4,574,120, Cl. 502-220.000.

Thomson-CSF: *See*—
Meunier, Paul L., 4,573,357, Cl. 73-517.00R.
Sillard, Gilles; and Baril, Michel, 4,574,288, Cl. 343-781.00P.
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Roswall, Stig; and Thorhus, Lene B., 4,574,080, Cl. 424-20.000.
Thorpe, John D.: *See*—
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., 4,573,744, Cl. 299-81.000.
Thrash, Tommy K.; Tock, Richard W.; Cox, Lyle V.; and Quattlebaum, W. Gregg, to Sunbelt America Corporation. Chemical heater. 4,573,447, Cl. 126-263.000.
Tietjen, Marlene; Hollenberg, Jane; and Rigg, Richard T., to Revlon, Inc. One-phase silicone-based cosmetic products containing wax. 4,574,082, Cl. 424-63.000.
TII Computer Systems, Inc.: *See*—
Olek, David J., 4,574,167, Cl. 179-175.30R.
Timberjack Inc.: *See*—
Johnson, Thomas E., 4,573,728, Cl. 294-119.400.
Timony, Peter E.: *See*—
Leone-Bay, Andrea; and Timony, Peter E., 4,574,010, Cl. 71-92.000.
Tinder, David V.: *See*—
Nonnenmacher, Ronald C.; and Tinder, David V., 4,573,341, Cl. 73-1.00D.
Tischer, James C.; and Larson, James W., to American Standard Inc. Compressor motor housing as an economizer and motor cooler in a refrigeration system. 4,573,324, Cl. 62-115.000.
Tissage et Enduction Serge Ferrari S.A.: *See*—
Ferrari, Serge, 4,574,107, Cl. 428-259.000.
Tissot, Jean. Pressure therapy apparatus. 4,573,453, Cl. 128-64.000.
TMC Corporation: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,573,701, Cl. 280-616.000.
Tobin-Arp Manufacturing Company: *See*—
Flaten, James F., 4,573,837, Cl. 408-111.000.
Tock, Richard W.: *See*—
Thrash, Tommy K.; Tock, Richard W.; Cox, Lyle V.; and Quattlebaum, W. Gregg, 4,573,447, Cl. 126-263.000.
Tocum, Incorporated: *See*—
Campbell, John G.; and Schoeneberger, Carl F., 4,574,305, Cl. 358-86.000.
Todokoro, Shigeru; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wave-shaping circuit. 4,574,206, Cl. 307-359.000.
Togashi, Kousaku: *See*—
Fujie, Hideo; and Togashi, Kousaku, 4,573,798, Cl. 356-432.000.
Tokai TRW & Co., Ltd.: *See*—
Abe, Michio, 4,573,372, Cl. 74-422.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Hirano, Yutaka; Kawakami, Hirokazu; Tanaami, Masaaki; Kosano, Motohiko; Takagi, Hiroshi; Ishiai, Yoshio; and Iwahashi, Ituo, 4,573,880, Cl. 417-312.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Atsumi, Shigeru; and Tanaka, Sumio, 4,574,273, Cl. 307-475.000.
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,574,361, Cl. 364-761.000.
Kitamoto, Manabu, 4,573,869, Cl. 415-182.000.
Nagano, Katsumi, 4,574,205, Cl. 307-310.000.
Nakata, Yuji, 4,573,872, Cl. 416-96.00A.
Ogawa, Atsushi, 4,574,202, Cl. 307-261.000.
Todokoro, Shigeru; and Kojima, Tadashi, 4,574,206, Cl. 307-359.000.
Yamagishi, Haruo; and Kamo, Hisao, 4,574,298, Cl. 357-71.000.
Tome, Richard E.: *See*—
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Tomlinson, Harold W., Jr.: *See*—
Blackwell, George F.; and Tomlinson, Harold W., Jr., 4,574,393, Cl. 382-17.000.
Tomonaga, Mitsuo: *See*—
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, 4,573,515, Cl. 164-468.000.
Tomse, Ljudevit: *See*—
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Tomy Kogyo Co., Inc.: *See*—
Seki, Yoshizo, 4,573,928, Cl. 434-348.000.
Top Tech, Inc.: *See*—
Hyatt, James R.; and Hyatt, Douglas K., 4,573,381, Cl. 82-36.00R.
Toray Industries, Inc.: *See*—
Masuda, Yutaka; and Nakamura, Teruo, 4,574,018, Cl. 156-72.000.
Torczon, David J. Tool guide. 4,573,276, Cl. 33-481.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujie, Hideo; and Togashi, Kousaku, 4,573,798, Cl. 356-432.000.
Toth, Alexander: *See*—
Strohl, Robert L.; Moore, Paul E.; and Toth, Alexander, 4,573,665, Cl. 266-48.000.
Toth, Vincent A.: *See*—
Kasner, William H.; Miller, Richard A.; and Toth, Vincent A., 4,574,180, Cl. 219-121.0LY.
Totoku Electric Co., Ltd.: *See*—
Sakai, Yoshio; and Yamada, Takeshi, 4,574,186, Cl. 219-528.000.
Toyama, Tadao: *See*—
Kobayashi, Kesanao; Toyama, Tadao; and Yoshida, Susumu, 4,573,782, Cl. 354-299.000.
Toyoda Gosei Co., Ltd.: *See*—
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, 4,573,693, Cl. 277-212.0FB.
Toyoshima, Takefumi: *See*—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,573,656, Cl. 248-562.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; and Katou, Shinji, 4,573,519, Cl. 164-97.000.
Nishiyama, Yosuke, 4,573,626, Cl. 228-6.100.
Ohnishi, Kenichi, 4,574,268, Cl. 340-64.000.
Watanabe, Haruo; Nakano, Kazuo; and Ohnishi, Akito, 4,573,443, Cl. 123-492.000.
Trailmor [Proprietary] Limited: *See*—
Rheeder, Frederik R. L.; and Dixon, Deon, 4,573,564, Cl. 194-250.000.
Transmatic, Inc.: *See*—
Mikalonis, Liudas K., 4,574,336, Cl. 362-260.000.
Trepaud, Georges. Heat exchangers with clusters of straight or corrugated tubes, especially to systems for supporting the tubes at fixed and movable axial levels. 4,573,528, Cl. 165-162.000.
Tricca, Raymond A.; and Foster, John K., to Packaging Industries, Inc. Exercise mat. 4,574,101, Cl. 428-138.000.
Triumph-Adler A.G. fur Buro- und Informationstechnik: *See*—
Pamler, Gerhard, 4,573,816, Cl. 400-661.000.
Troger, Norbert: *See*—
Merz, Eugen; Sandhaus, Sami; and Troger, Norbert, 4,573,915, Cl. 433-64.000.
Troutner, Vernon H., to Extracorporeal Medical Specialties, Inc. Peristaltic pump. 4,573,884, Cl. 417-374.000.
Troutner, Vernon H., to Extracorporeal Medical Specialties, Inc. Cassette drawer assembly for photoactivation patient treatment system. 4,573,962, Cl. 604-6.000.
True Temper Corporation: *See*—
Ipema, Neal J.; and Portz, William E., 4,573,311, Cl. 56-400.170.
TRW Automotive Products Inc.: *See*—
Willey, Ronald A., 4,573,646, Cl. 242-107.40A.
TRW Inc.: *See*—
Durkow, Carl J., 4,573,617, Cl. 225-96.000.
Feldman, David G.; and France, Hubert M., Jr., 4,574,284, Cl. 340-825.520.
Jones, Trevor O., 4,574,267, Cl. 340-58.000.
Smolley, Robert, 4,574,331, Cl. 361-393.000.
Tryon, James A.: *See*—
Holcomb, David A.; and Tryon, James A., 4,573,244, Cl. 241-169.000.
Tsuchida, Tetsuo: *See*—
Fujisaki, Masaru; Tsuchida, Tetsuo; Sasajima, Yoichi; Ito, Hiroshisa; and Morita, Masahiro, 4,573,745, Cl. 301-63.0PW.
Tsuchiya, Ichiro: *See*—
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Tsudakoma Kogyo Kabushiki Kaisha: *See*—
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Tsuji, Kenji: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,573,786, Cl. 354-416.000.
Tsutsumi, Masahiro; Nakazawa, Toru; and Utsunomiya, Yasuharu, to Mita Industrial Company, Ltd. Photosensitive composition for electrophotography having polyvinyl carbazole and silicone oil. 4,574,114, Cl. 430-81.000.
Tuccillo, Mark J., to American Home Products Corporation. Systems and methods for monitoring the fetal heart. 4,573,479, Cl. 128-698.000.
Tucker, David R.: *See*—
Minetola, James A.; and Tucker, David R., 4,573,986, Cl. 604-366.000.
Turner Quick-Lift Corporation: *See*—
VanDenberg, Ervin K.; and Eckelberry, Jim, 4,573,704, Cl. 280-704.000.
Ube Industries, Ltd.: *See*—
Okamoto, Hidemasa; Yamanaka, Mitsuo; and Fujii, Kazuyoshi, 4,574,154, Cl. 544-192.000.
Udell, Theodore H., to Container Corporation of America. Replaceable closure arrangement. 4,573,605, Cl. 220-304.000.
Uehara, Makoto: *See*—
Sugita, Katsuhiko; and Uehara, Makoto, 4,573,499, Cl. 139-370.200.
Uemura, Seiichi; Hirose, Takao; Sohda, Yoshio; Sakamoto, Takayoshi; and Kishimoto, Yoshio, to Nippon Oil Company Limited. Process for producing pitch based graphite fibers. 4,574,077, Cl. 423-447.600.
Ueno, Junichi: *See*—
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.
Ueno, Katumi: *See*—
Honda, Yasuhiro; Ueno, Katumi; Nishizaki, Genichi; Kitahara, Harumi; and Kamioka, Hiroshi, 4,573,261, Cl. 29-701.000.
Uetuji, Toshio; and Ohkubo, Noriaki, to Matsushita Refrigeration Company. Rotary compressor. 4,573,879, Cl. 417-312.000.

Uhing, Joachim. Closed rolling nut for transforming a rotary movement of a shaft into a thrust movement of the rolling nut. 4,573,367, Cl. 74-89.000.
Ukai, Mikio: *See—*
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, 4,573,693, Cl. 277-212.0FB.
Umpleby, Jeffrey D., to BP Chemicals Limited. Polymer composition. 4,574,133, Cl. 524-147.000.
Union Carbide Corporation: *See—*
Cheung, Harry, 4,574,006, Cl. 62-22.000.
Snyder, William B., 4,574,333, Cl. 361-433.000.
Union Oil Company of California: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Booth, Stuart E.; Clifford, Andrew W.; and Parratt, Noel J., 4,573,517, Cl. 164-61.000.
Quested, Peter N.; and Northwood, James E., 4,573,516, Cl. 164-61.000.
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Air Force: *See—*
Jewell, Jack L., 4,573,767, Cl. 350-354.000.
Army: *See—*
Conrad, Raymond W., 4,574,191, Cl. 250-203.00R.
Krauss, Timothy A.; and Kingston, Leo, 4,573,871, Cl. 416-20.00R.
Laten, Bobby W.; and Prater, Johnny L., 4,573,647, Cl. 244-3.120.
Lovelace, Donald E.; Schexnayder, Michael C.; and Snyder, George W., 4,573,412, Cl. 102-374.000.
Miller, Brian S.; and Dunn, Aubrey J., 4,573,627, Cl. 228-102.000.
Sayles, David C., 4,574,132, Cl. 523-466.000.
Energy: *See—*
Devaney, Howard F., 4,574,168, Cl. 200-61.530.
Horwitz, E. Philip; and Kalina, Dale G., 4,574,072, Cl. 423-9.000.
Martin, John C.; and Jett, James H., 4,573,796, Cl. 356-318.000.
Health and Human Services: *See—*
Rich, Alan H.; Gaasterland, Douglas E.; and Tedder, Thomas E., 4,573,467, Cl. 128-303.100.
Navy: *See—*
Burns, William K.; and Moeller, Robert P., 4,573,797, Cl. 356-350.000.
Ferrando, William, 4,574,096, Cl. 427-126.600.
Rado, George T.; Vittoria, Carmine; and Ferrari, James M., 4,574,259, Cl. 333-157.000.
Slack, Robert A., 4,574,252, Cl. 330-281.000.
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U.S. Philips Corporation: *See—*
Clarke, John A., 4,573,769, Cl. 350-432.000.
Eijkelenkamp, Antonius J. H.; de With, Gijsbertus; and de Wild, Willem R., 4,574,329, Cl. 361-321.000.
Haijkens, Bernardus, 4,574,212, Cl. 310-88.000.
Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., 4,574,216, Cl. 313-444.000.
Hulyer, Michael G., 4,574,300, Cl. 358-11.000.
Joormann, Hendrik J. M.; and Spierings, Gijsbertus A. C. M., 4,573,762, Cl. 350-96.340.
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,574,257, Cl. 331-116.00R.
Kinghorn, John R., 4,574,386, Cl. 377-121.000.
Mackereth, Thomas C., 4,574,302, Cl. 358-21.00R.
Nillesen, Antonius H. H. J., 4,574,307, Cl. 358-158.000.
Sachs, Jean-Pierre, 4,574,301, Cl. 358-18.000.
van de Plassche, Rudy J., 4,574,270, Cl. 340-347.0AD.
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., 4,573,330, Cl. 62-476.000.
Velo, Henri J., 4,574,253, Cl. 350-293.000.
U.S. Plastics Corp.: *See—*
Hill, Clinton W., 4,573,754, Cl. 339-60.00M.
U.S. Product Development Company: *See—*
Adell, Robert, 4,573,288, Cl. 49-462.000.
United States Steel Corporation: *See—*
Sinar, Michael M., 4,573,620, Cl. 226-190.000.
United States Surgical Corporation: *See—*
Conta, Robert L.; and Wallach, Harvey N., 4,573,468, Cl. 128-305.000.
Green, David T.; and Gunning, Edgar D., 4,573,622, Cl. 227-19.000.
United Technologies Automotive, Inc.: *See—*
Nonnenmacher, Ronald C.; and Tinder, David V., 4,573,341, Cl. 73-1.00D.
United Technologies Corporation: *See—*
Breault, Richard D.; Sawyer, Richard D.; and DeMarche, Thomas E., 4,574,112, Cl. 429-26.000.
Genereux, Paul D.; and Paulonis, Daniel F., 4,574,015, Cl. 148-11.50N.
Sandy, James J., Jr.; and Huth, Brian P., 4,573,866, Cl. 415-116.000.
Universal Symetrics Corporation: *See—*
Mednis, Juris M., 4,573,595, Cl. 215-10.000.
University of California, The Regents of the: *See—*
Libove, Joel M.; and Singer, Jerome R., 4,574,240, Cl. 324-306.000.
Singer, Jerome R., 4,574,239, Cl. 324-306.000.
University of Delaware: *See—*
Austin, Paul R., 4,574,150, Cl. 536-20.000.
Fakirov, Stoyko C.; and Schultz, Jerold M., 4,574,108, Cl. 428-292.000.
University of Illinois, The Board of Trustees of The: *See—*
Weber, Larry F., 4,574,280, Cl. 340-771.000.
University of Tokyo: *See—*
Masuzawa, Takahisa; and Tsuchiya, Ichiro, 4,574,179, Cl. 219-121.0PG.
UOP Inc.: *See—*
Frame, Robert R., 4,574,121, Cl. 502-163.000.
Urano, Fumiyoshi: *See—*
Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, 4,574,156, Cl. 544-398.000.
Urayama, Yuji, to Victor Company of Japan Ltd. Dictating machine having a revising function. 4,574,320, Cl. 360-62.000.
Utex Industries, Inc.: *See—*
Pippert, Aaron J., 4,573,283, Cl. 43-42.090.
Utsumi, Kazuaki: *See—*
Fujii, Shuzo; Shimada, Yuzo; Utsumi, Kazuaki; and Saito, Yutaka, 4,574,255, Cl. 331-25.000.
Utsumi, Makoto: *See—*
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Utsunomiya, Yasuharu: *See—*
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Valenti, Richard L.; and McCormick, Daniel J., to Stanley Works, The. Three knuckle hinge with bushing inserts in center knuckle and method of making same. 4,573,239, Cl. 16-273.000.
Valentine, Richard J., to Motorola, Inc. Electrical load monitoring system and method. 4,574,266, Cl. 340-52.00F.
Valeo: *See—*
Thirion de Briel, Jacques, 4,573,948, Cl. 474-28.000.
Valley, Robert T.: *See—*
Richardson, Raymond H.; and Valley, Robert T., 4,573,830, Cl. 406-84.000.
Valor Newhome Limited: *See—*
Rosiek, Jozef; Spruce, Frank; and Atkinson, Brian, 4,573,446, Cl. 126-92.00R.
VanDenberg, Ervin K.; and Eckelberry, Jim, to Turner Quick-Lift Corporation. Internal lift axle suspension system. 4,573,704, Cl. 280-704.000.
van den Broek, William A., to KDI Sylvan Pools, Inc. Vacuum filter system for swimming pools. 4,574,048, Cl. 210-136.000.
van de Plassche, Rudy J., to U.S. Philips Corporation. Analog-to-digital current converter. 4,574,270, Cl. 340-347.0AD.
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., to U.S. Philips Corporation. Absorption heat pump comprising an integrated generator and rectifier. 4,573,330, Cl. 62-476.000.
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., to Lummus Industries, Inc. Swinging charge door for baler. 4,573,403, Cl. 100-43.000.
van Gorkom, Gerardus G. P.: *See—*
Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., 4,574,216, Cl. 313-444.000.
VanMalderen, G. P., to Ontex PVBA. Apparatus and method of manufacturing hygienic disposable pads. 4,574,024, Cl. 156-202.000.
van Raalte, John A., to RCA Corporation. Apparatus and method for automatically measuring the shoe-length of a video disc stylus. 4,574,306, Cl. 358-107.000.
Van Rumpt, Herman W.: *See—*
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,574,257, Cl. 331-116.00R.
Vanwinkle, Eric J.: *See—*
Sexton, Joseph A., Jr.; and Vanwinkle, Eric J., 4,573,623, Cl. 227-66.000.
Varian Associates, Inc.: *See—*
Cochran, Ronald R., 4,574,261, Cl. 335-299.000.
Vartuli, James C.: *See—*
Chester, Arthur W.; Garwood, William E.; and Vartuli, James C., 4,574,043, Cl. 208-59.000.
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Hirasuna, Alan R.; and Veal, Gordon R., 4,573,537, Cl. 166-387.000.
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Bielfeldt, Klaus; and Braun, Dieter J., 4,574,001, Cl. 23-301.000.
Vetco Offshore, Inc.: *See—*
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Vickers, Incorporated: *See—*
Kennard, Reed H.; and Miller, Lewis R., 4,573,365, Cl. 74-15.800.
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Victor Company of Japan, Limited: *See—*
Hirohashi, Kazutoshi; and Ishigaki, Yukinobu, 4,574,390, Cl. 381-13.000.
Urayama, Yuji, 4,574,320, Cl. 360-62.000.
Video Research Limited: *See—*
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Vincent, Rodney P.: *See—*
Mayon, Allen J., 4,573,682, Cl. 273-148.00B.
Visner, Sidney: *See—*
Ross, Malcolm F.; and Visner, Sidney, 4,574,069, Cl. 376-267.000.

Visser, Teunis: *See*—
Fan, Robert J.; and Visser, Teunis, 4,573,760, Cl. 350-96.210.
Vistakon, Inc.: *See*—
Bayshore, Charles A., 4,573,775, Cl. 351-161.000.
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Rado, George T.; Vittoria, Carmine; and Ferrari, James M., 4,574,259, Cl. 333-157.000.
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Aschauer, Johann, 4,573,861, Cl. 414-751.000.
Vogl, Allen W. Connector adapter for printed circuit board of computer. 4,573,753, Cl. 339-17.0LM.
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Vulic, Sekula. Swivel clamp. 4,573,655, Cl. 248-278.000.
W. Schlafhorst & Co.: *See*—
Bertrams, Josef, 4,573,313, Cl. 57-22.000.
Brockmanns, Karl-Josef; and Lunenschloss, Joachim, 4,573,312, Cl. 57-5.000.
Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Duplex copying system. 4,573,789, Cl. 355-14.0SH.
Waddill, Harold G.: *See*—
Sellstrom, Kathy B.; and Waddill, Harold G., 4,574,143, Cl. 525-438.000.
Wagner, Fredric M.: *See*—
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 4,574,025, Cl. 156-245.000.
Wagner, Wolfgang. Suction injector. 4,573,970, Cl. 604-115.000.
Wahlco, Inc.: *See*—
Junkers, Gerd, 4,573,638, Cl. 239-397.500.
Wako Pure Chemical Industries, Ltd.: *See*—
Morita, Masao; Sugimoto, Jiro; Mizuno, Komei; Tanaka, Motoaki; and Urano, Fumiyoshi, 4,574,156, Cl. 544-398.000.
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Wales, Denis I.: *See*—
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Walker, Thomas M.: *See*—
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Wallace Murray Corporation: *See*—
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Wallo, Andrea M.: *See*—
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Walsh, John: *See*—
Szachowicz, Edward H.; and Walsh, John, 4,573,460, Cl. 128-200.260.
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Wang, Chung S., to Texas Instruments Incorporated. Plasma etch method for TiO_2 . 4,574,177, Cl. 219-121.0PE.
Wang, Der-Shi, to Allied Corporation. Compact shock-absorber for tie-down devices. 4,573,558, Cl. 188-268.000.
Wang Laboratories, Inc.: *See*—
Dayton, Douglas C.; LaCount, Clifford E.; and McConchie, Burton G., 4,574,318, Cl. 358-285.000.
Ward, Richard; and Cooper, Kenneth, to Dobson Park Industries Plc. Casting method and apparatus. 4,573,518, Cl. 164-69.100.
Wardell, Myron H., Jr., to RCA Corporation. Sealing fixture for color kinescopes. 4,573,935, Cl. 445-66.000.
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Bennett, Laurence M., 4,574,173, Cl. 219-10.530.
Warner-Lambert Technologies, Inc.: *See*—
Hill, Arthur T., 4,573,771, Cl. 350-521.000.
Warnke, Egon F. Method for stimulating the falling asleep and/or relaxing behavior of a person and an arrangement therefor. 4,573,449, Cl. 128-1.00C.
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Spelber, Leonard G., 4,573,642, Cl. 241-46.00B.
Watanabe, Akira: *See*—
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, 4,574,309, Cl. 358-212.000.
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Watanabe, Junichi: *See*—
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,574,369, Cl. 369-44.000.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Electrically operated fuel pump apparatus. 4,573,882, Cl. 417-366.000.
Watanabe, Yasunori, to Brother Kogyo Kabushiki Kaisha. Printer. 4,573,815, Cl. 400-642.000.
Waters, Michael A.; and Boll, Daniel P., to Application Engineering Corporation. Extrusion die with external and internal cooling means. 4,573,893, Cl. 425-71.000.
Waters, William M., to United States of America, Navy. Fixed aperture, rotating feed, beam scanning antenna system. 4,574,287, Cl. 343-756.000.
Watts, George T.: *See*—
Smith, William T.; Rooney, Timothy M.; and Watts, George T., 4,573,509, Cl. 152-158.000.
Wawra, Gerhard F.: *See*—
Jones, Donald A.; Wawra, Gerhard F.; and Moss, William R., 4,573,898, Cl. 425-145.000.
Weaver, Ronald C.: *See*—
Steensen, Wayne L.; and Weaver, Ronald C., 4,574,091, Cl. 426-548.000.
Webb, Ted H.; and Spector, George. Arrow slingshot. 4,573,445, Cl. 124-22.000.
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Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,573,403, Cl. 100-43.000.
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Webster, Harold F.: *See*—
Glascock, Homer H., II; Neugebauer, Constantine A.; and Webster, Harold F., 4,574,299, Cl. 357-81.000.
Weger, Kenneth F., Jr.: *See*—
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,573,731, Cl. 296-376.000.
Weikl, Andreas; and Merkel, Volkmar, to Schneider Medintag AG. Method and apparatus for removing and/or enlarging constricted areas in vessels conducting body fluids. 4,573,966, Cl. 604-53.000.
Weinblatt, Lee S. Camera autofocus technique. 4,574,314, Cl. 358-227.000.
Weinlich, Leopold. Projectile speed measuring apparatus. 4,574,238, Cl. 324-178.000.
Weinundbrot, Hubert, to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG. Device for affixing adhesive labels to objects. 4,574,027, Cl. 156-352.000.
Weiss, Wilhelm, to Krones AG Hermann Kronseder Maschinenfabrik. Device for cleaning container filling machines. 4,573,486, Cl. 134-104.000.
Weitman, Jacob. Apparatus for treating contaminated gas. 4,574,062, Cl. 261-147.000.
Welker, Mathias P., to Owens-Illinois, Inc. Gob arrival sensor for a glass forming machine. 4,574,009, Cl. 65-158.000.
Wenger, Fredy. Temperature control circuitry for a cooking apparatus. 4,574,185, Cl. 219-494.000.
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Schlegel, Urs; Tomse, Ljudevit; and Wenger, Urs, 4,573,542, Cl. 177-132.000.
Westeren, Herbert W.; Harrison, Ronald A.; and Tavitian, Vartan M., to C. I. Hayes Inc. Apparatus for quenching substantially flat workpieces. 4,573,667, Cl. 266-114.000.
Westinghouse Electric Corp.: *See*—
Baker, Donal E., 4,574,340, Cl. 363-41.000.
Blaushild, Ronald M.; and Tome, Richard E., 4,574,070, Cl. 376-289.000.
Burack, Robert D.; and Brachold, Rudolph W., 4,574,172, Cl. 219-10.49R.
deSilva, Sunil G.; and Hearp, Charles W., 4,574,071, Cl. 422-14.000.
Ezekoye, Levi I., 4,573,344, Cl. 73-46.000.
Howell, Cecil A.; and Lacy, Ernest R., 4,573,847, Cl. 414-63.000.
Jung, Ingvar K. E., 4,573,526, Cl. 165-134.100.
Kasner, William H.; Miller, Richard A.; and Toth, Vincent A., 4,574,180, Cl. 219-121.0LY.
Luongo, Michael C., 4,573,358, Cl. 73-660.000.
Santilli, Vincent J., 4,574,169, Cl. 200-114.00B.
Westvaco Corporation: *See*—
Ringley, Michael B., 4,574,032, Cl. 162-38.000.
White, E. E.: *See*—
Smith, Alexander; and Baggs, Burton D., 4,573,306, Cl. 56-10.400.
White, Lee A., to Ranco Incorporated. Refrigerant reversing valve. 4,573,497, Cl. 137-625.290.
White, Timothy P. Inflatable knock-down guitar. 4,573,391, Cl. 84-291.000.
Whitfield, Daniel. Ignition system. 4,573,438, Cl. 123-146.50A.
Whitman Medical Corporation: *See*—
Gordon, Marvin; and Lichtenstein, Joseph, 4,573,658, Cl. 251-95.000.
Wicanders AB: *See*—
Berglund, Jan, 4,573,601, Cl. 215-252.000.
Wick, Gerald H., to Outboard Marine Corporation. Lawn mower dead man control. 4,573,307, Cl. 56-11.800.

Wicker, Thomas H., Jr.; and Barbee, Robert B., to Eastman Kodak Company. Polyester resins capable of forming containers having improved gas barrier properties. 4,574,148, Cl. 528-173.000.

Wideman, Merle L. Thumb ring. 4,573,331, Cl. 63-15.000.

Wieck, Karl, to Supfina Maschinenfabrik Hentzen GmbH & Co KG. Apparatus for superfinishing bearing rollers. 4,573,289, Cl. 51-57.000.

Wieland, Heinz, to Wilhelm Gebhardt GmbH. External rotor motor having a cooling system. 4,574,210, Cl. 310-59.000.

Wiemann, Dieter; and Bodusch, Gunther, to Bison-Werke Bahre & Greten GmbH & Co. KG. Plant for the manufacture of particleboard. 4,573,899, Cl. 425-145.000.

Wiener, Robert P., to Litton Systems, Inc. Hub moment sensor for a horizontal rotor aircraft. 4,573,351, Cl. 73-178.00H.

Wietschorke, Stephan; Ruschek, Gerhard; and Sausner, Andreas, to VDO Adolf Schindling AG. Valve arrangement. 4,573,441, Cl. 123-339.000.

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Shanton, Kenneth J., 4,574,294, Cl. 346-210.000.

Wildgen, Leo F.: *See*—
Jusire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 4,574,025, Cl. 156-245.000.

Wildmoser, Martin M., to Bemis Company, Inc. Unit load wrapping with uniform wrap tension along the periphery of the wrapped load. 4,573,305, Cl. 53-466.000.

Wilh. Quester Maschinenfabrik GmbH: *See*—
Ruffer, Alfred; Maubach, Peter; Haas, Johannes; and Quester, Horst, 4,573,484, Cl. 131-327.000.

Wilhelm Gebhardt GmbH: *See*—
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Wilkinson, Rudolph P. Set of building articles and method of making and using the set to construct a predesigned, pre-engineered structure. 4,573,295, Cl. 52-105.000.

Wilkinson, Rudolph P. Interlocking building blocks. 4,573,301, Cl. 52-607.000.

Wilkinson, Samuel C. W., to Crane Packing Limited. Mechanical face seals. 4,573,691, Cl. 277-96.100.

Willbanks, Weldon C.; and Spector, George. Hay bale processor. 4,573,846, Cl. 414-24.600.

Willcox, Kenneth W.; and Mills, Kenneth R., to Phillips Petroleum Company. Antihaze compositions and process. 4,574,134, Cl. 524-157.000.

Wille, Herbert S.: *See*—
Kunst, Robert J.; Lahey, Gerald F.; and Wille, Herbert S., 4,573,594, Cl. 213-51.000.

Willey, Ronald A., to TRW Automotive Products Inc. Mode selection retractor. 4,573,646, Cl. 242-107.40A.

Williams, Gareth F., to AT&T Bell Laboratories. Nonintegrating lightwave receiver. 4,574,249, Cl. 330-59.000.

Williams International Corporation: *See*—
Egan, Michael J.; and Quill, Gary J., 4,573,876, Cl. 416-213.00R.

Williams, J. Webster, Jr., to Arthro-Medic, Inc. Arthroscopic surgery method. 4,573,482, Cl. 128-804.000.

Wilman, Hugh; and Brotton, James. Document scanners. 4,574,316, Cl. 358-285.000.

Wilner, Leslie B., to Becton, Dickinson and Company. Capacitive transducer. 4,574,327, Cl. 361-283.000.

Wilson, Alan G., to Cam Gears Limited. Piston and cylinder assembly, a power assisted steering gear which includes such an assembly and a method of forming a piston for such an assembly. 4,573,399, Cl. 92-110.000.

Wilson, David H.: *See*—
Pastor, Jose ; Parker, Harry L.; and Wilson, David H., 4,574,357, Cl. 364-518.000.

Wilson, Stephen S.: *See*—
Holsztynski, Wlodzimierz; and Wilson, Stephen S., 4,574,394, Cl. 382-41.000.

Wimmer, Guenther W., to Tektronix, Inc. Phase locked synchronizer for printer timing control. 4,574,291, Cl. 346-75.000.

Winter, Alfred: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,573,701, Cl. 280-616.000.

Winter, Joseph: *See*—
Smith, Warren F.; Shapiro, Eugene; and Winter, Joseph, 4,573,253, Cl. 29-460.000.

Winther, Howard A., to Royal Waterbeds, Inc. Damped waterbed mattress and method for manufacturing same. 4,574,026, Cl. 156-274.400.

Wisecarver, Martin L.: *See*—
Arrington, John P.; Jaraczewski, Kathleen A.; Moisson, Marc F.; and Wisecarver, Martin L., 4,573,607, Cl. 221-25.000.

Wisman, Craig B.; Pierce, William; and Donachy, James H., to Research Corporation. Right ventricular assist device. 4,573,997, Cl. 623-3.000.

Wittmann, Franz; and Wittmann, Karl. Insert for a piece of lounging furniture. 4,573,226, Cl. 5-236.00R.

Wittmann, Karl: *See*—
Wittmann, Franz; and Wittmann, Karl, 4,573,226, Cl. 5-236.00R.

Wix, David A.: *See*—
Heilman, Nikolaus J.; Wix, David A.; and Egerer, Gary M., 4,573,902, Cl. 425-543.000.

Wo, Chee-Yuan: *See*—
Cheng, Cheng-Yi; Lee, Shou-Yuan; Chen, Kwang-Ming; and Wo, Chee-Yuan, 4,574,141, Cl. 525-252.000.

Wolf, Alby H.; and Oswald, Thomas L., to GNB Batteries Inc. Electrically heatable mold and method of casting metal straps. 4,573,514, Cl. 164-4.100.

Wolf, Kurt; and Andre, Wolfram K., to Kurt Wolf & Co. KG. Saucepan and cover for a cooking utensil, particulary a steam pressure cooking pan. 4,574,184, Cl. 219-440.000.

Wolf, Robert. Convertible seat-bed and storage unit. 4,573,225, Cl. 5-118.000.

Wolf, Tobin. Driving toy. 4,573,936, Cl. 446-7.000.

Woma-Apparatebau Wolfgang Massberg & Co. GmbH: *See*—
Maasberg, Wolfgang; and Huperz, Adalbert, 4,573,886, Cl. 417-454.000.

Wortberg, Walter. Impact dissipator. 4,573,216, Cl. 2-2.000.

Worthington Industries, Inc.: *See*—
Starling, Jeffrey T.; and Jones, Bruce D., 4,573,603, Cl. 220-5.00R.

Wrezel, James A.: *See*—
Polak, Anthony J.; Wrezel, James A.; and Beuhler, Allyson J., 4,573,768, Cl. 350-357.000.

Wright, Antony P.: *See*—
Lee, Chi-Long; Lim, Thomas F.; and Wright, Antony P., 4,574,149, Cl. 528-42.000.

Wrigley, John G. Construction panel and method of providing the same. 4,573,296, Cl. 52-108.000.

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Muller, Rolf; and Wurdak, Reinhold, 4,574,211, Cl. 310-68.00R.

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Kelly, Thomas C.; Wurscher, Robert J.; Petrich, Dennis M.; and Rideout, Earl H., 4,574,235, Cl. 324-158.00F.

Wursthorn, Karl R.: *See*—
Bresser, Robert E.; and Wursthorn, Karl R., 4,574,135, Cl. 524-182.000.

Yada, Eiichi, to Takeda Riken Co., Ltd. Multi-slope analog-to-digital converter. 4,574,271, Cl. 340-347.0NT.

Yagi, Yoshio: *See*—
Imahashi, Hiromichi; Kawahara, Akira; Konishi, Takao; Morimoto, Yoshihumi; Terui, Michio; and Yagi, Yoshio, 4,573,629, Cl. 228-173.200.

Yamada, Hidetoshi: *See*—
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, 4,574,309, Cl. 358-212.000.

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Yamada, Tomoyoshi: *See*—
Nakata, Rikizo; Okumoto, Tadaoki; Ukai, Mikio; Suzuki, Takamasa; and Yamada, Tomoyoshi, 4,573,693, Cl. 277-212.0FB.

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Kajiyama, Koichi; Moro, Norio; Sajiki, Kazuaki; and Yamaguchi, Tadayoshi, 4,573,792, Cl. 356-301.000.

Yamamoto, Kazuo: *See*—
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Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, to Aichi Steel Works, Ltd.; and Chuo Hatsujo Kabushiki Kaisha. Method of treating steel for a vehicle suspension spring having a good sag-resistance. 4,574,016, Cl. 148-144.000.

Yamanaka, Mitsuo: *See*—
Okamoto, Hidemasa; Yamanaka, Mitsuo; and Fujii, Kazuyoshi, 4,574,154, Cl. 544-192.000.

Yamatake Honeywell: *See*—
Arakawa, Mutsumi; Ueno, Junichi; Kawaguchi, Yozo; Shimura, Norio; Matsunaga, Shoichi; and Fukaya, Kiyoshi, 4,574,283, Cl. 340-825.080.

Yamauchi, Junnosuke: *See*—
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,574,139, Cl. 525-61.000.

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Yamazoe, Mikio: *See*—
Asada, Eiichi; Inokuma, Toshio; and Yamazoe, Mikio, 4,574,055, Cl. 252-514.000.

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Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,573,891, Cl. 418-173.000.

Yang, Jan-Chin: *See*—
Krutchen, Charles M.; Ranjan, Raj; and Yang, Jan-Chin, 4,573,345, Cl. 73-56.000.

Yao, Samuel S.; and Chu, Samuel K. F., to Hughes Helicopters, Inc. Collective and cyclic in-mast pitch control system for a helicopter. 4,573,873, Cl. 416-114.000.

Yasuhara, Seishi: *See*—
Sekiguchi, Akira; Ichikawa, Takeo; Inoue, Kazuo; Fujimori, Kyoichi; Hirano, Yutaka; and Yasuhara, Seishi, 4,573,347, Cl. 73-119.00A.

Yasui Sangyo Co., Ltd.: *See*—
Aoki, Hiroyasu, 4,573,552, Cl. 187-8.500.

Yates, John B., III; and Smith, David J., to General Electric Company. Sulfonated polyimides and polyamic acids and method for their preparation. 4,574,144, Cl. 525-435.000.

Yearout, James D.; Provin, Robert R.; and Browne, John S. Fractionating apparatus. 4,574,007, Cl. 62-42.000.

Yo, Bynyo. Filter respirator for protection against smoke and toxic gases. 4,573,464, Cl. 128-206.150.

Yokohama Rubber Co., Ltd., The: *See*—
Kabe, Kazuyuki; and Morikawa, Tuneo, 4,573,511, Cl. 152-548.000.

Yokote, Yoshihiro: *See*—
Kawai, Osamu; Yamamoto, Kazuo; and Yokote, Yoshihiro, 4,573,709, Cl. 280-804.000.
Yoneda, Akiyoshi, to Amada Company, Limited. Bending test apparatus. 4,573,360, Cl. 73-850.000.
Yoon, Hyun-Nam: *See*—
Gibbon, John D.; Lawler, Terry E.; Yoon, Hyun-Nam; and Charbonneau, Larry F., 4,574,066, Cl. 264-85.000.
Yoshida, Churyo: *See*—
Asada, Takafumi; Yoshida, Churyo; Koda, Minoru; and Ohno, Hideaki, 4,573,807, Cl. 384-100.000.
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, to Honda Giken Kogyo Kabushiki Kaisha; and Hokushin Kogyo Kabushiki Kaisha. Fluid-sealed engine mounting. 4,573,656, Cl. 248-562.000.
Yoshida Kogyo K.K.: *See*—
Hatagishi, Shingo, 4,573,264, Cl. 29-766.000.
Matsumoto, Masao, 4,573,383, Cl. 83-11.000.
Yoshida, Susumu: *See*—
Kobayashi, Kesanao; Toyama, Tadao; and Yoshida, Susumu, 4,573,782, Cl. 354-299.000.
Yoshida, Yasuharu, to NEC Corporation. Demodulator with AGC circuit for multi-level quadrature amplitude-modulated carrier wave. 4,574,246, Cl. 329-124.000.
Yoshii, Kenta: *See*—
Kitamura, Minoru; Yoshii, Kenta; Kawasaki, Shozo; Matsuo, Katsuyoshi; and Tomonaga, Mitsuo, 4,573,515, Cl. 164-468.000.
Yoshikawa, Yoshiro: *See*—
Goto, Shinji; Kingo, Takao; Ochi, Akira; and Yoshikawa, Yoshiro, 4,573,694, Cl. 280-5.00A.
Yoshimura, Masahiro, to Sharp Kabushiki Kaisha. Circuit for driving display apparatus. 4,574,315, Cl. 358-241.000.
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, to Kubota, Ltd. Automatic running work vehicle. 4,573,547, Cl. 180-168.000.
Young, Henry N., IV; and Smith, Richard C., to Banff Golf Company, Inc. Golf club head with transparent striking face. 4,573,685, Cl. 273-173.000.
Young, John H.: *See*—
Appleyard, Francis J.; and Young, John H., 4,574,065, Cl. 264-76.000.
Yourkowski, Frank M.; and Zoerb, Melvin C., to Boeing Company, The. Integrated alternate gear extension and ground-crew door opening/closing system for an aircraft. 4,573,649, Cl. 244-102.00R.
Yunoki, Yutaka: *See*—
Arisawa, Yasuo; Kusazaki, Yoshimasa; Yamada, Hidetoshi; Watanabe, Akira; and Yunoki, Yutaka, 4,574,309, Cl. 358-212.000.
Zacharias, Ellis M., Jr., to Nusonics, Inc. Method of measuring the composition of an oil and water mixture. 4,573,346, Cl. 73-61.10R.
Zago, Giovanni. Crash helmet. 4,573,222, Cl. 2-424.000.
Zahavi, Joseph; and Tamir, Shoshana, to Technion Research and Development Foundation Ltd. Method for obtaining a selective surface for collectors of solar and other radiation. 4,574,041, Cl. 204-38.300.
Zahradnik, Franz: *See*—
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, 4,574,131, Cl. 523-209.000.
Zakrzewski, Czeslaw: *See*—
Muller, Erwin; Zakrzewski, Czeslaw; and Matzdorf, Burghard, 4,573,624, Cl. 227-121.000.
Zato, Thomas J., to Zenith Electronics Corporation. Digital radio telephone. 4,574,163, Cl. 179-2.0EA.
Zaydel, Wieslaw S., to General Motors Corporation. Apparatus for mounting plastic body panel. 4,573,733, Cl. 296-191.000.
Zeiler, Hans-Joachim: *See*—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Stadler, Peter; Metzger, Karl G.; Opitz, Hans-Georg; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,574,122, Cl. 514-42.000.
Zenith Electronics Corporation: *See*—
Nowaczyk, Philip J., 4,574,224, Cl. 315-408.000.
Zato, Thomas J., 4,574,163, Cl. 179-2.0EA.
Zenith Radio Corporation: *See*—
Krause, Charles A.; and Rajaram, Babu, 4,574,277, Cl. 340-703.000.
Zerbel, Allen J.: *See*—
Covey, Joel P.; and Zerbel, Allen J., 4,573,794, Cl. 356-346.000.
Ziegler, Walter: *See*—
Theysohn, Rainer; Dorst, Hans G.; McKee, Graham E.; Steinberger, Rolf; Ziegler, Walter; and Zahradnik, Franz, 4,574,131, Cl. 523-209.000.
Zimmer, Inc.: *See*—
Lower, Jerry L., 4,573,458, Cl. 128-92.00D.
Zinner GmbH, Firma: *See*—
Zinner, Karl, 4,573,832, Cl. 407-70.000.
Zinner, Karl, to Zinner GmbH, Firma. Single and multiple recessing tool. 4,573,832, Cl. 407-70.000.
Zoerb, Melvin C.: *See*—
Yourkowski, Frank M.; and Zoerb, Melvin C., 4,573,649, Cl. 244-102.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Agranat, Edward A.: *See*—
Blatt, William F.; Agranat, Edward A.; and Rigopulos, Peter N., Re. 32,089, Cl. 210-651.000.

Amicon Corporation: *See*—
Blatt, William F.; Agranat, Edward A.; and Rigopulos, Peter N., Re. 32,089, Cl. 210-651.000.

AT&T Bell Laboratories: *See*—
Jaccodine, Ralph J.; and Michejda, John A., Re. 32,090, Cl. 357-51.000.

Blatt, William F.; Agranat, Edward A.; and Rigopulos, Peter N., to Amicon Corporation. Blood fractionating process and apparatus for carrying out same. Re. 32,089, Cl. 210-651.000.

Jaccodine, Ralph J.; and Michejda, John A., to AT&T Bell Laboratories. Silicon integrated circuits. Re. 32,090, Cl. 357-51.000.

Michejda, John A.: *See*—
Jaccodine, Ralph J.; and Michejda, John A., Re. 32,090, Cl. 357-51.000.

Rigopulos, Peter N.: *See*—
Blatt, William F.; Agranat, Edward A.; and Rigopulos, Peter N., Re. 32,089, Cl. 210-651.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 282,838, Cl. D13-23.000.

Adams, Peter G., to Hestair Kiddicraft Limited. Child's clown figure toy. 282,860, 3-4-86, Cl. D21-173.000.

Alair, Douglas: *See*—
Hoffman, Ronald J.; Alair, Douglas; LaFleur, Robin S.; and Salzberger, Claude, 282,796, Cl. D6-445.000.

Alessandro, Sante G., to Erwin-Lambeth, Inc. Lamp base. 282,874, 3-4-86, Cl. D26-93.000.

Allison, Philip J.; and Smith, Morley L., to T. S. Simms & Co. Limited. Roller coater paint tray. 282,882, 3-4-86, Cl. D32-53.100.

Allway Tools, Inc.: *See*—
Gringer, Donald, 282,881, Cl. D32-48.000.

Arcair Company: *See*—
Chaney, David B.; and Duwell, Michael J., 282,816, Cl. D8-30.000.
Johnson, David E.; and McCall, Kenneth E., 282,817, Cl. D8-71.000.

Aristo Designart Inc.: *See*—
Kostios, Ari, 282,825, Cl. D10-25.000.

Baker, Knapp & Tubbs, Inc.: *See*—
Doezema, William, 282,798, Cl. D6-495.000.
Doezema, William, 282,799, Cl. D6-495.000.

Barati, Ronald E. Animal crate. 282,880, 3-4-86, Cl. D30-1.000.

Benning, L.; Novecosky, E.; and Van Ee, D., to Del-Air Systems Ltd. Air-to-air heat exchanger. 282,870, 3-4-86, Cl. D23-136.000.

Best, Lillian C. Portable barbecue. 282,811, 3-4-86, Cl. D7-332.000.

Bos, Arnoldus J. B. M., to International Chemical Engineering Estab. Locking ring for meat casings or the like. 282,818, 3-4-86, Cl. D8-394.000.

Bulgari, Marina, to Marina B. Creation S.A. Earring. 282,829, 3-4-86, Cl. D11-75.000.

Burhop, Nancy. Toy rakehead. 282,859, 3-4-86, Cl. D21-120.000.

Caframo Limited: *See*—
Hutter, Frank, 282,871, Cl. D23-158.000.

Canon Kabushiki Kaisha: *See*—
Yomo, Takashi, 282,842, Cl. D14-94.000.
Yoshioka, Eiichi; and Murakami, Osamu, 282,853, Cl. D18-7.000.
Yoshioka, Eiichi; and Harada, Yuji, 282,854, Cl. D18-7.000.

Carelli, Paul. Packaged bottle of pills. 282,820, 3-4-86, Cl. D9-337.000.

Chaney, David B.; and Duwell, Michael J., to Arcair Company. Air carbon-arc cutting and gouging torch. 282,816, 3-4-86, Cl. D8-30.000.

Charron, Daniel: *See*—
Laurent, Andre; and Charron, Daniel, 282,819, Cl. D9-314.000.

Choate, R. Larry: *See*—
Thornton, Gary E.; Zarren, Robert A.; and Choate, R. Larry, 282,837, Cl. D13-12.000.

Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH. Combined handle and adapter ferrule with tightening knob for gardening implements. 282,812, 3-4-86, Cl. D8-1.000.

ComputerLand Corporation: *See*—
Hoffman, Ronald J.; Alair, Douglas; LaFleur, Robin S.; and Salzberger, Claude, 282,796, Cl. D6-445.000.

Consolidated Devices, Inc.: *See*—
Grabovac, Bosko, 282,815, Cl. D8-24.000.

Conti, Rino: *See*—
Daenen, Robert H. C. M.; and Conti, Rino, 282,808, Cl. D7-79.000.
Daenen, Robert H. C. M.; and Conti, Rino, 282,809, Cl. D7-79.000.

Cooper Industries, Inc.: *See*—
Katsman, Iiya, 282,794, Cl. D6-432.000.

Daenen, Robert H. C. M.; and Conti, Rino, to Dart Industries Inc. Food storage container or the like. 282,808, 3-4-86, Cl. D7-79.000.

Daenen, Robert H. C. M.; and Conti, Rino, to Dart Industries Inc. Food storage container or the like. 282,809, 3-4-86, Cl. D7-79.000.

Daly, Douglas P. Album page for storing computer disks or similar article. 282,856, 3-4-86, Cl. D19-33.000.

D'Aquisto, James L. Pickguard for a guitar. 282,852, 3-4-86, Cl. D17-20.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Conti, Rino, 282,808, Cl. D7-79.000.
Daenen, Robert H. C. M.; and Conti, Rino, 282,809, Cl. D7-79.000.

Del-Air Systems Ltd.: *See*—
Benning, L.; Novecosky, E.; and Van Ee, D., 282,870, Cl. D23-136.000.

Densen, Mark. Chest. 282,795, 3-4-86, Cl. D6-440.000.

Depraz, Eric, to Depraz S.A. Device to follow lines on a drawing and to register the ordinates of given points of said drawing. 282,848, 3-4-86, Cl. D14-114.000.

Depraz S.A.: *See*—
Depraz, Eric, 282,848, Cl. D14-114.000.

Dixon, Linda H. Display stand. 282,797, 3-4-86, Cl. D6-465.000.

DKZ, Incorporated: *See*—
Kashary, Charles R., Jr., 282,863, Cl. D22-1.000.

Doezema, William, to Baker, Knapp & Tubbs, Inc. Table base. 282,798, 3-4-86, Cl. D6-495.000.

Doezema, William, to Baker, Knapp & Tubbs, Inc. Table base. 282,799, 3-4-86, Cl. D6-495.000.

Dreimanis, Juris Z.: *See*—
Vinogradov, Vladimir F.; Dreimanis, Juris Z.; Kruklis, Aivars A.; and Kave, Dzintars A., 282,839, Cl. D14-27.000.

Duracell Inc.: *See*—
Noyes, Androus D., 282,821, Cl. D9-415.000.
Noyes, Androus D., 282,822, Cl. D9-415.000.

Duwell, Michael J.: *See*—
Chaney, David B.; and Duwell, Michael J., 282,816, Cl. D8-30.000.

Ekuan, Kenji, to Epson Corporation. Personal computer. 282,844, 3-4-86, Cl. D14-106.000.

Epson Corporation: *See*—
Ekuan, Kenji, 282,844, Cl. D14-106.000.
Kurihara, Masaki, 282,843, Cl. D14-100.000.

Erwin-Lambeth, Inc.: *See*—
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Fasco Industries, Inc.: *See*—
Parnell, Clyde B., 282,869, Cl. D23-73.000.

Figueiredo, John S.: *See*—
Shigenaka, Bob S.; and Figueiredo, John S., 282,868, Cl. D23-48.000.

Franek, Jozef T.; and Porucznik, Paul, to Metal Box, plc. Combined tray and lid. 282,823, 3-4-86, Cl. D9-429.000.

Franek, Jozef T.; and Porucznik, Paul, to Metal Box plc. Tray. 282,824, 3-4-86, Cl. D9-429.000.

Funabashi, Genichi, to Kubota, Ltd. Agricultural tractor. 282,849, 3-4-86, Cl. D15-23.000.

Futami, Masaru, to Lowrey Industries, Inc. Keyboard musical instrument or similar article. 282,850, 3-4-86, Cl. D17-1.000.

Gardena Kress & Kastner GmbH: *See*—
Clivio, Franco; and Raffler, Dieter, 282,812, Cl. D8-1.000.

Goins, Douglas E.; and Rhodes, Johnny E. Storage bracket for a chain saw. 282,801, 3-4-86, Cl. D6-553.000.

Gonzales, Jose M. G. Horse racing gameboard. 282,858, 3-4-86, Cl. D21-27.000.

Grabovac, Bosko, to Consolidated Devices, Inc. Torque tool readout unit. 282,815, 3-4-86, Cl. D8-24.000.

Gringer, Donald, to Allway Tools, Inc. Hand scraper tool. 282,881, 3-4-86, Cl. D32-48.000.

Harada, Yuji: *See*—
Yoshioka, Eiichi; and Harada, Yuji, 282,854, Cl. D18-7.000.

Harvey, Franklin D. Hair pick. 282,875, 3-4-86, Cl. D28-31.000.
Harvey, Franklin D. Comb. 282,876, 3-4-86, Cl. D28-31.000.
Harvey, Franklin D. Hair lift. 282,877, 3-4-86, Cl. D28-31.000.
Hasse, Patricia W. Guard funnel. 282,807, 3-4-86, Cl. D7-68.000.
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Hayes, Dennis D.; and Hayes, Dean D., 282,872, Cl. D24-2.000.
Hayes, Dennis D.; and Hayes, Dean D. X-Ray film cassette holder for use with children. 282,872, 3-4-86, Cl. D24-2.000.
Hayes, Ronald G., to L. R. Nelson Corporation. Lawn sprinkler. 282,866, 3-4-86, Cl. D23-8.000.
Hestair Kiddicraft Limited: *See—*
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Hettinga, Siebolt. Tilt and rotate base for a display monitor. 282,847, 3-4-86, Cl. D14-114.000.
Hitachi, Ltd.: *See—*
Tsuburaya, Kazuyuki; Nishiyama, Takanori; and Yanagisawa, Kazunori, 282,846, Cl. D14-113.000.
Hoffman, Ronald J.; Alair, Douglas; LaFleur, Robin S.; and Salzberger, Claude, to ComputerLand Corporation. Register counter. 282,796, 3-4-86, Cl. D6-445.000.
Holder, Howard M. Mat marking device or similar article. 282,828, 3-4-86, Cl. D10-62.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Hoogner, Richard L., to Security Switch Ltd. Programmable light timing switch. 282,826, 3-4-86, Cl. D10-40.000.
Hoogner, Richard L., to Security Switch Ltd. Programmable light timing switch for mounting on an electrical outlet. 282,827, 3-4-86, Cl. D10-40.000.
Hutter, Frank, to Caframo Limited. Fan. 282,871, 3-4-86, Cl. D23-158.000.
Ibaraki, Howard T.: *See—*
May, Richard L.; and Ibaraki, Howard T., 282,873, Cl. D26-45.000.
Inaba, Hiroshi, to Nitsuko Limited. Key telephone set. 282,841, 3-4-86, Cl. D14-58.000.
International Chemical Engineering Estab.: *See—*
Bos, Arnoldus J. B. M., 282,818, Cl. D8-394.000.
Ion Tech, Inc.: *See—*
Thornton, Gary E.; Zarren, Robert A.; and Choate, R. Larry, 282,837, Cl. D13-12.000.
Jennings, Roger L., to R. Jennings Manufacturing Co., Inc. Painter's cap printing attachment for silk screen machine or the like. 282,855, 3-4-86, Cl. D18-22.000.
Johnson, David E.; and McCall, Kenneth E., to Arcair Company. Positioner to support a gas cutting torch, a welding torch or the like. 282,817, 3-4-86, Cl. D8-71.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
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Kain, James M., to Questor Corp. Stroller. 282,831, 3-4-86, Cl. D12-129.000.
Kain, James M., to Questor Corp. Stroller foot rest. 282,832, 3-4-86, Cl. D12-133.000.
Kashary, Charles R., Jr., to DKZ, Incorporated. Police baton. 282,863, 3-4-86, Cl. D22-1.000.
Katsman, Iiya, to Cooper Industries, Inc. Battery storage cabinet. 282,794, 3-4-86, Cl. D6-432.000.
Kave, Dzintars A.: *See—*
Vinogradov, Vladimir F.; Dreimanis, Juris Z.; Kruklis, Aivars A.; and Kave, Dzintars A., 282,839, Cl. D14-27.000.
Kelsey-Hayes Company: *See—*
Main, John A., 282,835, Cl. D12-209.000.
Main, John A., 282,836, Cl. D12-209.000.
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Koper, Barry R. Facial appliance for makeup. 282,861, 3-4-86, Cl. D21-190.000.
Kostios, Ari, to Aristo Designart Inc. Clock. 282,825, 3-4-86, Cl. D10-25.000.
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Kubota, Ltd.: *See—*
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Kurihara, Masaki, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Portable electronic computer. 282,843, 3-4-86, Cl. D14-100.000.
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LaFleur, Robin S.: *See—*
Hoffman, Ronald J.; Alair, Douglas; LaFleur, Robin S.; and Salzberger, Claude, 282,796, Cl. D6-445.000.
Laurent, Andre; and Charron, Daniel, to Promotions Jean-Rene Inc. Packaging container. 282,819, 3-4-86, Cl. D9-314.000.
Lewis, Barbara K., to Qume Corporation. Video terminal. 282,845, 3-4-86, Cl. D14-113.000.
Lockett, William, III; and Oliver, Edward D., to Lockett, William, III. Infant seat. 282,791, 3-4-86, Cl. D6-333.000.
Lowrey Industries, Inc.: *See—*
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Main, John A., to Kelsey-Hayes Company. Vehicle wheel. 282,835, 3-4-86, Cl. D12-209.000.
Main, John A., to Kelsey-Hayes Company. Vehicle wheel. 282,836, 3-4-86, Cl. D12-209.000.
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Mariol, James F. Wading pool. 282,862, 3-4-86, Cl. D21-252.000.
Marshall, Eric J., to Marshall Telephone Corporation Limited, The. Telephone. 282,840, 3-4-86, Cl. D14-53.000.
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Noyes, Androus D., to Duracell Inc. Combined packaging and display container for a flashlight. 282,822, 3-4-86, Cl. D9-415.000.
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Remboldt, Kerdall. Black belt. 282,789, 3-4-86, Cl. D2-380.000.
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Righini, Roy. Head rest. 282,802, 3-4-86, Cl. D6-596.000.
Righini, Roy. Head rest. 282,803, 3-4-86, Cl. D6-596.000.
Roberton, Charlene A. Nail polish dryer. 282,879, 3-4-86, Cl. D28-58.000.
Ryan, Bobby W.; and Woods, Glynn E., to WFI International, Inc. Welding outlet. 282,867, 3-4-86, Cl. D23-40.000.
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Schwarzli, Joseph W. Coin operated vending machine. 282,857, 3-4-86, Cl. D20-7.000.
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Hoogner, Richard L., 282,827, Cl. D10-40.000.
Shigenaka, Bob S.; and Figueiredo, John S. Commode chair. 282,868, 3-4-86, Cl. D23-48.000.
Skidmore, Herbert M. Shaving razor. 282,878, 3-4-86, Cl. D28-46.000.
Smith, Maynard L. Freeze plug tool. 282,814, 3-4-86, Cl. D8-14.000.
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Unger, Steve A., 282,805, Cl. D7-25.000.
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Tanaka, Shinken, to Nissan Motor Co., Ltd. Automobile hood. 282,833, 3-4-86, Cl. D12-173.000.

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Tappan, R. Warner; and Tappan, Pam R. Bender board holder. 282,813, 3-4-86, Cl. D8-1.000.

Thornton, Gary E.; Zarren, Robert A.; and Choate, R. Larry, to Ion Tech, Inc. Ion source control panel. 282,837, 3-4-86, Cl. D13-12.000.

Tornese, Angelo G. Guitar body. 282,851, 3-4-86, Cl. D17-18.000.

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Tsuburaya, Kazuyuki; Nishiyama, Takanori; and Yanagisawa, Kazunori, to Hitachi, Ltd. Computer display. 282,846, 3-4-86, Cl. D14-113.000.

Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 282,804, 3-4-86, Cl. D7-23.000.

Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 282,805, 3-4-86, Cl. D7-25.000.

Unger, Steve A., to Syracuse China Corporation. Decal for a plate of similar article. 282,806, 3-4-86, Cl. D7-39.000.

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Smith, Craig G., H36, Cl. 204-52.00R.

Berkowitz, Daniel, to United States of America, Army. Freeze dried cooked meats. H35, 3-4-86, Cl. 426-135.000.

Christou, Aristos; and Davey, John E., to United States of America, United States. Tunnett diode and method of making. H29, 3-4-86, Cl. 357-13.000.

Cowan, Floyd S.: *See*—
Wagner, John R.; Kirschstein, Werner P.; and Cowan, Floyd S., H31, Cl. 209-237.000.

Davey, John E.: *See*—
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Gubser, Donald U.; and Wolf, Stuart A., to United States of America, United States. Multilayer super-conducting shield and method of manufacturing same. H39, 3-4-86, Cl. 204-192.00S.

Jameson, Robert L.; and Segletes, Steven, to United States of America, Army. Shaped-charge. H33, 3-4-86, Cl. 102-476.000.

Kartik, John S.; and Richardson, William M., to United States of America, Energy. Stud hardware with self-contained stud anti-rotation feature and method of installing studs. H32, 3-4-86, Cl. 411-120.000.

Kim, Yong K.: *See*—
Radel, Robert J.; and Kim, Yong K., H38, Cl. 564-63.000.

Kirschstein, Werner P.: *See*—
Wagner, John R.; Kirschstein, Werner P.; and Cowan, Floyd S., H31, Cl. 209-237.000.

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Schettino, Anthony J., H37, Cl. 206-316.000.

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Werling, Kevin J., to United States of America, Air Force. Aircraft cabin pressurization control system tester. H34, 3-4-86, Cl. 73-40.50R.

Wolf, Stuart A.: *See*—
Gubser, Donald U.; and Wolf, Stuart A., H39, Cl. 204-192.00S.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF MARCH, 1986

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B. Master image chip organization technique or method. T106,201, 3-4-86, Cl. 29-577.00C.

Chang, Chi S.: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., T106,201, Cl. 29-577.00C.

Fox, Barry C.: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., T106,201, Cl. 29-577.00C.

Ghafghaichi, Majid: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., T106,201, Cl. 29-577.00C.

Jen, Teh-Sen: *See*—
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Palmieri, John A.: *See*—
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CLASSIFICATION OF PATENTS

ISSUED MARCH 4, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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308 4,574,194
327.2 4,574,195
328 4,574,196
334 4,574,197
493.1 4,574,198
561 4,574,199

CLASS 251

95 4,573,658
129.02 4,573,659
195 4,573,660
234 4,573,661

CLASS 252

8.55 C 4,574,050
70 4,574,051
90 4,574,052
134 4,574,053
188.31 4,574,054
514 4,574,055
4,574,056

CLASS 254

29 A 4,573,662
89 H 4,573,663

CLASS 260

101 4,574,057
112.5 R 4,574,058
512 C 4,574,061

CLASS 261

147 4,574,062

CLASS 264

60 4,574,063
70 4,574,064
76 4,574,065
85 4,574,066
209.8 4,574,067

CLASS 266

44 4,573,664
48 4,573,665
80 4,573,666
114 4,573,667
196 4,573,668

CLASS 269

271 4,573,669

CLASS 270

20.1 4,573,671
39 4,573,670
45 4,573,672

CLASS 271

111 4,573,673
118 4,573,674
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CLASS 272

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CLASS 273

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152 4,573,692
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704 4,573,704
708 4,573,705
734 4,573,706
792 4,573,707
804 4,573,709
808 4,573,708
813 4,573,710

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98 4,573,711

CLASS 285

12 4,573,712
94 4,573,715
319 4,573,713
323 4,573,716
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365 4,573,717

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17 4,573,718
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145 4,573,721
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82.28 4,573,725
86.33 4,573,726
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158 4,573,729

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1 S 4,573,730
108 4,573,732
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CLASS 299

39 4,573,743
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63 PW 4,573,745

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211 4,573,751

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786 4,574,289
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154 4,573,801
167 4,573,803

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CLASS 368

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144 4,573,806

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289 4,574,070

CLASS 377

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121 4,574,386

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18 4,574,391
51 4,574,392

CLASS 382

17 4,574,393
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CLASS 384

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322 4,573,810
493 4,573,809
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CLASS 400

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214 4,573,813
568 4,573,814
642 4,573,815
661 4,573,816

CLASS 401

65 4,573,817
131 4,573,818
151 4,573,819
214 4,573,820

CLASS 402

78 4,573,821
80 L 4,573,822

CLASS 403

118 4,573,823
322 4,573,824
370 4,573,825

CLASS 404

90 4,573,826

CLASS 405

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293 4,573,828

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CLASS 407

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70 4,573,832

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239 R 4,573,839

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244 4,573,841

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58 4,573,843

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24.6 4,573,846
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463 4,573,855
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383 4,573,885
394 4,573,883
454 4,573,886
477 4,573,887
560 4,573,888

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173 4,573,891
219 4,573,892

CLASS 422

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CLASS 423

9 4,574,072
111 4,574,073
124 4,574,074
184 4,574,075
224 4,574,076
447.6 4,574,077
592 4,574,078

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63 4,574,082
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148 4,574,085

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555 4,573,903

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129 4,574,087
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194 4,574,113

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CLASS 436

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DESIGN PATENTS

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